



Cows and Fish Report

Determining Biodiversity Knowledge and Effective Program Messaging:

EVALUATION REPORT

Cows and Fish

Alberta Riparian Habitat Management Society

Report No. 036

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About Cows and Fish

Riparian areas are those areas along rivers, streams, lakes, wetlands, springs, and ponds that are strongly influenced by water and are recognized by water-loving vegetation. Cows and Fish is striving to foster a better understanding of how riparian areas function and how improvements in management strategies in riparian areas can enhance landscape health and productivity for the benefit of livestock producers, their communities and others who value these landscapes.

Cows and Fish Supporters and Members: Producers and community groups, Alberta Beef Producers, Trout Unlimited Canada, Alberta Agriculture and Rural Development, Alberta Sustainable Resource Development, Alberta Environment, Department of Fisheries and Oceans, Prairie Farm Rehabilitation Administration-Agriculture and Agri-Food Canada, Alberta Conservation Association.

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prepared for

**~ Cows and Fish ~
Alberta Riparian Habitat Management Society**

March 31, 2008

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EXECUTIVE SUMMARY

PURPOSE

This report provides results of a multi-phase evaluation project for the Cows and Fish program. The goals of the project were two-fold. The first goal was to determine gaps and benchmarks of biodiversity knowledge among landowners and agency staff, and then to develop and test new biodiversity messaging guided by those initial findings. The new user-informed and tested messages will be incorporated into future awareness tools. The revised tools are intended to be used by Cows and Fish extension staff; by extension staff within provincial and municipal agencies; and by partner, industry and community organizations working on riparian issues. The objective of using the revised tools is to help landowners and other land managers build and apply knowledge about biodiversity and riparian health into their management decisions and planning.

The second goal of this evaluation was to assess the effectiveness of a series of existing Cows and Fish print and digital format awareness tools, focusing broadly on tool content, format and impact, to determine tool strengths and weaknesses. The goal was to determine effectiveness in promoting (i) awareness, i.e. knowledge, and (ii) riparian management action. Results will inform Cows and Fish in modifying awareness tools for greater impact on future learning and management practices.

This project was designed and carried out by an independent consulting team at IMI *strategics* based in Edmonton, Alberta. IMI *strategics* specializes in strategic planning and program evaluation processes that employ community involvement methodologies. Direct participation from a scientist at Spencer Environmental Management Services, also of Edmonton, who is experienced in assessing environmental sustainability with an emphasis on landscape ecology, also contributed to the comprehensiveness of this evaluation. Data have been analyzed and are presented here following professional standards that ensure objectivity, completeness and accuracy.

BASELINE BIODIVERSITY KNOWLEDGE

Participants in this first phase of the evaluation completed a Baseline Biodiversity Knowledge survey (n=28) and took part in biodiversity workshops (n=25). While reported results accurately reflect the input received, the relatively low number of participants suggests some caution when interpreting results. Notwithstanding the relatively low number of participants, the following concepts were not well understood by those who did participate.

- *That there is any relationship between biodiversity and riparian areas* - further, only about two-thirds (64%) of the baseline survey respondents defined “biodiversity” correctly, compared to 86% who defined “riparian area” correctly.
- *That there are linkages between benefits associated with biodiversity* - at a variety of scales and for functions, such as landscape productivity, watershed-scale health, and personal well-being.

- *That there is inter-connectivity between short-term costs and long-term gain* - i.e. the ability to recognize that personal actions have both localized/personal and watershed scale benefits, as well as cumulative impacts, whether positive or negative in terms of biodiversity.

FOLLOW-UP BIODIVERSITY MESSAGE TESTING

Participants in this phase of the evaluation, some of whom had also participated in the earlier phase, completed an on-line Follow-Up Biodiversity Survey (n=120) to assess 15 test messages. Guided by gaps identified in the interim phase of the evaluation, test messages were categorized under two elements central to the Cows and Fish process.

- *Developing awareness and knowledge* - test messages were aimed at building an understanding of biodiversity; addressing misconceptions and barriers; and clarifying key components of biodiversity, including relationships to riparian and watershed health.
- *Promoting practice change* - test messages were aimed at encouraging management practices that support biodiversity, based on a sound understanding of biodiversity and riparian health.

The key themes demonstrated by the wording choices selected by respondents tended to reinforce the approach to program content currently used by Cows and Fish.

- *Simplicity* - keep language clear, precise and personalized, and build from basic concepts like “numbers” and then proceed to more complex ideas such as “resiliency”.
- *Connectivity* - communities and individuals are part of ecosystems as much as plants and animals, so continue to use both basic/foundational definitions as well as more subtle analogies to relate these ideas.
- *Audiences* - target with appropriate message types and content, which will differ between, for example, urban/rural, older/younger groups, etc.
- *Barriers and costs* - use techniques that break down barriers to action by providing specific information about the costs and the “how-to” of actions that support biodiversity, i.e. provide problem-specific solutions.

More specific recommendations for addressing barriers to learning and taking action through messaging include the following.

- *Reflect both participation and achievements within a given suite of messages.* For example: “Nutrient plan development on individual operations increased by 20% and water quality improved by 10% in their watershed”. In this way, individuals may be motivated by a sense of contribution, accomplishment and satisfaction gained by connecting their personal actions to benefits achieved at a broader scale.



- *Give balanced and broader coverage about the values and benefits of biodiversity and riparian health in messaging about management activities.* Project participants readily identified benefits of well-managed biodiversity that were associated with recreational activities and their aesthetic values, but were less likely to identify the ecological services, and economic and social benefits, that can also be achieved from sound management of other land uses. For example, demonstrate in messaging that all individuals and organizations outside of recreation and tourism contribute, through their actions, to supporting biodiversity, and will gain some personal or broader benefits from these actions. This is the case whether they are rural or urban residents, industrial operators, agricultural producers, municipal governments, or tourism and recreation operators and users. Each can play an important role regardless of where they are located or what they may do. In communicating this balance of roles, the costs and benefits of existing barriers to action may be diffused, whether the barriers are perceived or real.
- *Scale a problem and its solution to the individual.* This will help reduce the notion that the problems are so big that they can only be someone else's doing, and that there is little or nothing that an individual can do to address them. It can be difficult for an individual to rationalize their small contribution to the larger, even cumulative, impacts they may see around them, and more difficult still to predict and manage if it is perceived that they will become even bigger concerns in the future. Communicating the role of a variety of uses and impacts in a way that links individual negative contributions, and the summed effect of all contributions to environmental impact, can work well. Messaging to agricultural producers may be effective if it also acknowledges the impacts of land uses from other contributors and sources. For example: "Nitrates and *E.coli* from poor manure management, plus municipal sewage, plus industrial releases, add up to reduced downstream water quality. Given that industrial and municipal releases are closely regulated, if producers can help by meeting appropriate management practices, everyone benefits." Reference to methods of linking problems to solutions employed under, for example, community-based social marketing, may provide additional guidance here.

PRINT AND DIGITAL TOOL EFFECTIVENESS

The evaluation of the print awareness tools uncovered a number of both strengths and suggested improvements, which are detailed in this report. Overall, however, it is important to state that each of the three classes of tool examined in this evaluation generally mirrors the types of audiences that Cows and Fish typically attempts to reach and work with. A logical way to describe these audience types is by level of experience or exposure to the Cows and Fish program and its messages: individuals loosely classed as Beginner, Intermediate, and Advanced. In terms of depth of information and motivation to take action, the Fact Sheets are generally suitable for Beginners, providing the first program step of building awareness for different user groups, whether urban, rural, agricultural or recreational property owners, and so on. The Riparian Areas: A User's Guide to Health booklet is suitable primarily for Intermediate users, mostly in agriculture, since it provides greater explanation of riparian and biodiversity concepts and an introduction to management practices and potential solutions. Notwithstanding



its effectiveness in meeting the needs of Intermediate audiences, the User's Guide falls short of meeting the needs of Advanced users, who seek specific and detailed management planning and technical information to address problems they have identified and which they have now been motivated to fix. Nor does the User's Guide appeal as strongly to non-agricultural users, since its content is largely focused on agriculture. This finding is consistent with findings in other Cows and Fish evaluations, where a need for specific problem-solving technical tools was identified. Note that an evaluation of other tools within the broader Cows and Fish suite of tools that may address these requirements was not undertaken, since doing so fell outside the scope of this project.

While a set of recommendations specific to the tool format and content are provided in this report, the fundamental groupings that make up the suite of awareness tools does not require change, based on the tools examined in this evaluation.

Each awareness tool evaluated was rated as effective by a majority of workshop participants, but with some variation between Very and Somewhat Effective. Only the User's Guide received a solid majority rating of Very Effective.

Overall, the User's Guide was:

- categorized as very effective as an awareness tool by almost three-quarters (72%) of workshop participants;
- suitable for Intermediate readers (although not excluding Beginners) because it explains basic concepts and how to recognize potential problems by carrying out the self-assessment procedure, so it is effective at encouraging preliminary action steps;
- viewed as a good tool to begin the process of leading to individual action, but one that does not provide sufficient management detail to enable a more Advanced user to undertake targeted or comprehensive management action to deal with specific problems; and
- a document that could be strengthened by more detailed information about specific management actions to fix problems, once identified, for Advanced readers - likely most practical and effective to achieve by use of a companion document that parallels the current content of the User's Guide by linking specific solutions to specific problems. Note that the design intent of the User's Guide was not that it be a "how-to-fix-it" manual; rather, its purpose has been to help readers recognize what riparian health looks like, as the name suggests. Accordingly, participant feedback suggests that the booklet achieves that goal.

The Fact Sheets were:

- categorized overall as somewhat effective;
- considered appropriate as very introductory awareness tools that outline basic concepts associated with the tool-specific topic, i.e. content of these tools cannot and should not attempt to overwhelm the first-time reader with too much detail about management practices, and so realistically these tools are not intended to lead to specific behaviour changes;

- viewed as interesting because they were reader-friendly, in which text and photographs were well-matched, relevant, and together quickly communicated essential aspects of the topic;
- generally considered to be visually appealing, although a small number of participants commented that there were too many graphic elements, giving a somewhat cluttered appearance;
- considered to be helpful because the tone of the text was both informative and constructive, while being neither patronizing nor overly technical; and
- effective because they provided some introductory ideas about action that could be taken by an individual to improve riparian health and/or biodiversity; however, this could be enhanced by switching to more active rather than passive language.

Most participants in the evaluation were relatively experienced land managers. As “evaluators”, while they acknowledged the value of the Fact Sheets for those less knowledgeable or experienced than themselves, in their role as practitioners of land management, they inevitably sought more management-oriented detail. This dichotomy may explain the primarily positive comments about the Fact Sheets, but their lower overall rating compared to the User’s Guide.

Observations about the Digital Stories were as follows.

- Overall response to the digital story as an awareness tool was very positive, with minor exceptions about the relevance of some content.
- For the most part, the digital stories were seen as effective at initially drawing in the viewer’s interest, particularly those that included a specific operating situation, i.e. demonstrating a change in management or land-use, that the viewer could relate to personally.
- The stories were emotive, and hence appealing, showing situations that people could relate to their own situation or their own life, for example different values within families or communities.
- The stories were seen a good way to “get the story across”, both in terms of visual appeal and the personalized approach.
- While seen as useful tools, some discussion highlighted the challenges in making them available to appropriate audiences because of the need to access a digital format and associated limitations such as file size. Several mentions were made that the tool, accordingly, could be most useful with a younger audience.

1. INTRODUCTION

1.1 PURPOSE

This document provides results of an evaluation of biodiversity knowledge and tool effectiveness in the Cows and Fish program. Based on available timeframes and program needs, the evaluation was structured in two phases as follows.

Phase A: Step 1 - Baseline of Biodiversity Knowledge
 Step 2 - Effectiveness of Selected Awareness Tools

Phase B: Assessing New Biodiversity Messaging

Phase A-Step 1 focused on determining baseline biodiversity knowledge among landowners and agency staff as a means of refining and targeting biodiversity message content into existing and new awareness tools. The end goal of this step was to provide a foundation on which Cows and Fish staff could build new biodiversity messages to embed into future awareness tools for use by Cows and Fish extension staff; by extension staff within provincial and municipal agencies; and by partner, industry and community organizations working on riparian issues. The development of suitable biodiversity messages, guided by input from the types of people who will be the ultimate recipients and/or users of biodiversity programming, is expected to help landowners and other land managers build and apply knowledge about biodiversity, riparian health, and forage/grazing production in their riparian management decisions and planning.

Phase B involved the creation and testing of biodiversity messages developed by Cows and Fish based on results of Phase A-Step 1, providing an immediate feedback loop to evaluate whether the new messaging would be meaningful to potential recipients.

Phase A-Step 2 involved an evaluation of the effectiveness of a series of existing Cows and Fish print and digital format awareness tools. Step 2 was not specific to (nor did it exclude) the biodiversity topic. Its focus was more broadly on tool content, format and impact to determine tool strengths and weaknesses. The goal was to determine effectiveness in promoting (i) awareness, i.e. learning knowledge, and (ii) appropriate riparian management action. Understanding effectiveness was intended to guide Cows and Fish in modifying the selected tools for greater impact on learning and management practices, if and where indicated.

1.2 METHODOLOGY

Phase A centred around a series of three workshops in which participants undertook the following.

- Completed the Baseline Biodiversity Knowledge survey (print format) designed to test basic biodiversity knowledge and attitude factors, in order to gain some benchmarks on knowledge accuracy and potential gaps related to specific biodiversity concepts, and to the extent possible, gain understanding of that knowledge in relation to factors that may impact an individual's ability or desire to learn and/or take action that supports biodiversity.



- Participated in structured small-group discussions in the workshop setting to address four key questions about biodiversity, with the goal of providing more in-depth explanation about knowledge accuracy and any gaps.
- Participated in structured workshop discussions about the effectiveness and appropriateness of the content of five Cows and Fish Fact Sheets, a variety of draft Digital Stories, and the Riparian Areas: A User's Guide to Health booklet, with discussion framed around the practicality and usefulness of tool content and format in promoting riparian awareness and action.

Phase B of this evaluation involved the Follow-Up Biodiversity Survey, completed on-line by workshop participants and other community members, for example members of local riparian groups contacted by broadcast email, as well as the general public known to those involved in this project). The goal here was to obtain feedback on the appropriateness and fit of the biodiversity messages newly developed by Cows and Fish, based on input obtained in Phase A-Step 1.

1.3 PARTICIPATION

For Phase A, workshop participants were purposively selected by Cows and Fish team members, to reflect a range of landowners from across the province. Almost all participants were members of community riparian groups known to Cows and Fish staff, with the remainder being agency representatives actively involved in riparian management issues in their area. Those individuals who had planned to attend but were unable to at the last minute were given an opportunity to complete the Baseline Biodiversity Survey in the week following the workshops, and these data are included in the workshop results reported here.

Three workshops were held in January, 2008. A summary of locations and attendance is provided in Table 1.

TABLE 1				
WORKSHOP LOCATIONS AND ATTENDANCE				
Date	Location	Landowner #	Agency / Organization #	Total #
January 14	Sandy Beach	5	2	7
January 29	Rockyford	8	1	9
January 30	Millarville	8	1	9
Total		21	4	25

In addition to the 25 attending the workshops, who all completed the Baseline Biodiversity Survey, a small number of other community members present at venue sites were also given the opportunity to complete the survey, and at least one also completed the survey on-line. These individuals brought the total number of completed Baseline Biodiversity Surveys to 28.

For Phase B, a total of 120 Follow-up Biodiversity Surveys were received on-line.



1.4 LIMITATIONS

It must be noted when considering the results presented in this report that the workshop discussion was limited to a relatively small number of people (n=25); that the majority of those participants (92%) had previous exposure to Cows and Fish, some of it significant and occurring over a number of years; and that the timeframe for discussion was necessarily limited to that available within the workshop setting. The low respondent number on the Baseline Biodiversity Survey was also a function of those who were able to attend the workshops. Best efforts were made to promote attendance; extreme weather played a significant role in reducing attendance.

Accordingly, while workshop results presented here accurately reflect the input received, these results may not reflect the wider population that Cows and Fish may wish to target with future biodiversity messaging and awareness tools. This limitation should be kept in mind when interpreting and using the information provided in this report.

1.5 RESEARCH INDEPENDENCE

This project was designed and carried out by an independent consulting team at IMI *strategics* based in Edmonton, Alberta. IMI *strategics* specializes in strategic planning and program evaluation processes that employ community involvement methodologies. Direct participation from a scientist at Spencer Environmental Management Services, also of Edmonton, who is experienced in assessing environmental sustainability with an emphasis on landscape ecology, also contributed to the comprehensiveness of this evaluation. Data have been analyzed and are presented here following professional standards that ensure objectivity, completeness and accuracy.

2. BASELINE BIODIVERSITY KNOWLEDGE

Results from the Baseline Biodiversity Survey are presented in this section by means of a series of tables for the knowledge topics covered in the workshops. The individual tables reflect the prevalence of each topic, as mentioned by participants in workshop discussions. Note that the workshop discussions were limited to small numbers of participants; that the majority (92%) of participants had previous exposure to Cows and Fish and so may have a more accurate understanding of riparian areas and biodiversity than might the general population; and that the timeframe for discussion was necessarily limited within the workshop setting.

As was intended, while the total number of participants was low, a reasonable mix of agricultural and non-agricultural landowners was achieved. Among the participants who reported the type of property they owned, 12 were primarily livestock producers; six were part-time recreational property owners; five were mixed farmers; two were full-time non-agricultural landowners; and one was primarily a crop producer. The remainder described themselves as being an “other” type of landowner (and some chose more than one category). The baseline survey instrument is attached as Appendix A. For completeness, tabular data charts for all questions on the survey are provided in Appendix B.

The manner of presenting results here is intended to highlight knowledge items within each topic area, ranging from those ideas that were “top of mind” among participants, i.e. mentioned the most, through to those topics that were not mentioned at all: a type of relative presence-absence assessment.

This assessment is accompanied by Small Group Answers, the summary answers created for each question at two of the three workshops. Break-out groups, having had the opportunity to review input from everyone present, created the Small Group Answers based on that input, contributed from everyone who had rotated to each “question station” in the meeting room. These collective answers may be considered illustrative of concepts and ideas that community members might themselves have, or may develop given the opportunity, to reflect their understanding of the biodiversity topics covered in this evaluation.

Together, these data lead to some observations about potential learning opportunities that are based on apparent areas of greater knowledge, and of gaps in knowledge, within the workshop participant group. These observations were provided to Cows and Fish in an earlier draft version of this report, with the goal of guiding the Cows and Fish team to develop potential new biodiversity messages for testing in Phase B of this project.

2.1 UNDERSTANDING OF BIODIVERSITY

Exploration of baseline biodiversity knowledge was structured around five topic areas, as set out in Table 2. Table 2 also identifies the priority of importance of some topics within this evaluation, as determined at project start-up by Cows and Fish staff. Topics of higher priority were given relatively greater focus in the Baseline Biodiversity Survey. In order to obtain as accurate a baseline as possible for whether respondents could define



the term biodiversity, they were not provided with a correct definition prior to completing their survey, since it was considered that doing so might unduly influence the answers subsequently provided on the surveys.

TABLE 2 BIODIVERSITY KNOWLEDGE TOPIC AREAS				
#	Discussed at Workshop	Included in Survey	Topic Areas / Items	Priority of Topic ^a
1.		X	What is biodiversity? <ul style="list-style-type: none"> Define biodiversity Define riparian 	
2.	X	X	What does biodiversity look like? (includes functions such as): <ul style="list-style-type: none"> Structural complexity Habitat Connectivity Water supply/storage Water quality/temperature Buffering/erosion control/soil-building 	high high medium low low low
3(a).	X	X	What are the benefits of having biodiversity? <ul style="list-style-type: none"> Increased fish and animal diversity Increased diversity leading to resilience to drought/fire/flood/disease etc. Increased livestock health Increased productivity/profitability Aesthetics Watershed scale benefits (water, habitat) Recreation 	high high
3(b).	X	X	What are the costs of having biodiversity (including importance of/attitude factors)? <ul style="list-style-type: none"> Importance of biodiversity to you Aspects within your control Barriers that limit action to promote biodiversity 	
4.	X	X	What are the threats to biodiversity? <ul style="list-style-type: none"> Cumulative effects Various human practices 	
5.	X	X	What are you doing, or can you do, to enhance biodiversity? (includes management practices such as): <ul style="list-style-type: none"> Formal planning Techniques to improve function, minimize impact, etc. 	

^a As assigned by Cows and Fish

2.1.1 Can You Define Biodiversity?

Survey Definition Responses

TABLE 3 THE BEST DEFINITION OF BIODIVERSITY	
	% / #
An environment's ability to support the greatest number of people and their livelihoods	0 / 0
The variety and type of plant and animal life found in a natural environment	64 / 18
A way of describing an environment when it has lots of plants, animals and ecosystems that are similar to each other	25 / 7
Not sure / Don't know	11 / 3
Total	100 / 28

TABLE 4 THE BEST DEFINITION OF A RIPARIAN AREA	
	% / #
A waterbody such as a lake, wetland, spring, stream or river	7 / 2
An area with water-loving vegetation that borders a lake, wetland, spring, stream or river	86 / 24
An upland located away from the water	7 / 2
Not sure / Don't know	0 / 0
Total	100 / 28

Observations and Opportunities

- Only 64% defined the term biodiversity correctly, while 86% defined the term riparian correctly; one-quarter (25%) defined biodiversity incorrectly and over 10% just weren't sure.
- Foundation definition for biodiversity is needed.
- Linkage between biodiversity and riparian areas is needed to merge the concepts; see also Table 5 which indicates that relatively few mentions were made of riparian in describing what biodiversity looks like.

2.1.2 What Does Biodiversity Look Like?

Workshop Group Discussion

TABLE 5 TOPIC AREA: WHAT DOES BIODIVERSITY LOOK LIKE? (PREVALANCE)				
Item	Prevalence in Discussion			
	<i>many</i>	<i>some</i>	<i>few</i>	<i>none</i>
Pre-defined Items				
i. Structural complexity	X			
ii. Water supply/storage			X	
iii. Water quality/temperature				X
iv. Buffering/erosion control/soil-building				X
v. Habitat	X			
vi. Connectivity		X		
New Items				
vii. A variety of, or multiple, things, that are balanced and/or in balance with each other	X			
viii. Riparian areas; "healthy" areas			X	
ix. "Native" component		X		
x. Nutrient recycling			X	
xi. The "big picture" (part of the way the whole world is)			X	
xii. Includes people/activities			X	

Small-Group Answers

Break-out groups created the following Small Group Answers based on the collective input from all the workshop participants who had rotated to the relevant "question station".

- "It's an ecosystem in equilibrium; everything in harmony. Diverse, stratified native biological communities."
- "The balance between the highest variety of plant and animal species and age groups that inhabit a certain area, while utilizing the area to its betterment through proper management."

Interesting Quote(s)

- "It's a combination of things, not just one thing, not just shrubbery, not just reeds and bullrushes, it's all of those combined. The more you have of that, the more you stretch out into insect life, mammals, rabbits, deer and birdlife. One by itself is not enough. You have to have a little bit of all of it."

- “It’s how, in our life around us, even in our own home, how different things are... are [they] all the same colour, same height, thickness, width, is every wood pile the same size? You’ve got a smidgeon of everything, big, little, colour, white, a grand mish-mash.”

Survey True-False Responses

TABLE 6 TOPIC AREA: WHAT DOES BIODIVERSITY LOOK LIKE? (TRUE-FALSE)				
	True	False	Not Sure / Don't Know	Total
	% / #	% / #	% / #	% / #
Structural Complexity				
Thick and tangled vegetation along the water's edge helps that waterbody to trap sediment.	85 / 23	4 / 1	11 / 3	100 / 27
Water Quantity/Quality & Buffering/Erosion Control				
Keeping the banks and shores around lakes nicely manicured helps keep the water clean.	0 / 0	100 / 28	0 / 0	100 / 28
Dead or dying woody vegetation left along banks and shores increases toxins in the water.	3 / 1	79 / 22	18 / 5	100 / 28
Habitat				
Most fish, bird and animal species prefer sparse vegetation cover to help them easily see predators and potential food sources.	4 / 1	96 / 27	0 / 0	100 / 28
Grazing a pasture continuously from spring through fall is one way to help maintain habitat for most bird species.	0 / 0	97 / 27	3 / 1	100 / 28
More than ¾ of Canada's birds need areas that border waterbodies for some part of their lifecycle.	82 / 23	0 / 0	18 / 5	100 / 28
Connectivity				
Allowing natural species to travel easily across landscapes is a good way to help maintain genetic variety within their populations.	96 / 26	0 / 0	4 / 1	100 / 27

Survey Agree-Disagree Responses

TABLE 7 TOPIC AREA: WHAT DOES BIODIVERSITY LOOK LIKE? (AGREE-DISAGREE)				
	Agree	Disagree	Not Sure/ Don't Know	Total
	% / #	% / #	% / #	% / #
Habitat				
Wetlands and bush areas are essential to providing good habitat for plants, insects, amphibians, birds and other wildlife.	100 (27)	0 / 0	0 / 0	100 / 27

Observations and Opportunities

- Answers on most habitat questions were over 90% accurate, including one relating to a specific management action (grazing continuously) that affects habitat negatively.
 - Accuracy was slightly lower (82%) on the relationship of bird habitat to riparian area lifecycle requirements, with 18% reporting that they were not sure.
 - Similarly, thick and tangled vegetation that makes good bird habitat had accuracy of 85%, but 11% were not sure.
 - Further, accuracy on dead and dying vegetation along the shore (also good habitat) was reported as 79%, with 18% not sure.
 - Conversely, wetland and bush habitat were understood by all (100%) to be good habitat, so the gap in understanding may be the relationship between habitat/biodiversity related to other (non-wetland) types of waterbodies.
- Therefore, specific relationships between riparian area structured vegetation, habitat, biodiversity and water quality could be targeted for messaging.
- Note that there was, however, solid understanding of the inappropriateness of manicured banks and shores in terms of water toxicity (100% accuracy).

2.1.3 What are the Benefits and Costs of Biodiversity?

Benefits

Workshop Group Discussion

TABLE 8 TOPIC AREA: WHAT ARE THE BENEFITS OF BIODIVERSITY? (PREVALENCE)				
Item	Prevalence in Discussion			
	<i>many</i>	<i>some</i>	<i>few</i>	<i>none</i>
<i>Pre-defined Items</i>				
i. Increased biodiversity			X	
ii. Increased livestock health			X	
iii. Increased productivity / profitability			X	
iv. Aesthetics		X		
v. Long-term sustainability		X		
vi. Increased diversity <i>leading to resiliency</i> to disturbance		X		
vii. Watershed scale benefits (water / habitat)			X	
viii. Recreation (including tourism and educational opportunities)	X			
<i>New Items</i>				
ix. Safety / access to and availability of food (for example, through habitat and/or improved forage)	X			
x. Clean air and water		X		
ix. Balanced/humans have a sense of belonging within			X	
x. Free time/reduce lawn maintenance cost and time			X	

Small-Group Answers

Break-out groups created the following Small Group Answers based on the collective input from all the workshop participants who had rotated to the relevant “question station”.

- “Healthier food and water through healthier landscapes.”
- “Increased habitat for critters and personal satisfaction at having contributed to that now for future generations.”

Survey True/False Responses

TABLE 9 TOPIC AREA: WHAT ARE THE BENEFITS OF BIODIVERSITY? (TRUE-FALSE)				
	True % / #	False % / #	Not Sure / Don't Know % / #	Total % / #
Increased Productivity				
Proactively managing waterbodies and areas adjacent to them helps to increase forage productivity.	82 / 23	4 / 1	14 / 4	100 / 28
Long-term Sustainability				
Streams that are narrow and deep tend to provide a more sustainable water supply for people, livestock and wildlife compared to streams that are wide and shallow.	39 / 11	47 / 13	14 / 4	100 / 28
Increased Diversity Provides Resiliency to Disturbance				
The greater the number of plant species in an area, the greater the risk posed to them by disturbances such as fire, disease and pests.	14 / 4	79 / 22	7 / 2	100 / 28
Watershed-scale Benefits				
Riparian areas represent less than 5% of Alberta's landscapes so play a very small role in watershed health.	11 / 3	86 / 24	3 / 1	100 / 28

Survey Agree/Disagree Responses

TABLE 10 TOPIC AREA: WHAT ARE THE BENEFITS OF BIODIVERSITY? (AGREE-DISAGREE)				
	Agree % / #	Disagree % / #	Not Sure/ Don't Know % / #	Total % / #
Increased Diversity Provides Resiliency to Disturbance				
A wide variety of insects on your place indicates an ecosystem at risk.	7 / 2	63 / 17	30 / 8	100 / 27
Watershed-scale Benefits				
Keeping lots of birds and other wildlife on your place keeps your watershed in good shape.	78 / 21	4 / 1	18 / 5	100 / 27

Observations and Opportunities

- A notable gap in awareness occurred with respect to linking increased productivity and long-term sustainability as benefits of biodiversity, with 14% being unsure that proactively managing waterbodies helps increase forage productivity, and 14% being unsure that the morphology of streams is a reflection of their ability to provide long-term sustainable water supply -- a visual cue that could continue to be emphasized in messaging. On this same concept, almost half (47%) answered incorrectly, with just over one-third (39%) answering correctly, the lowest level of accuracy in this topic area.
 - While this was a somewhat more technically difficult question than others, it supports the workshop discussion finding that long-term sustainability and watershed benefits were not the most common ideas mentioned, perhaps suggesting that, again, individuals are challenged in making the leap to seeing the benefits of their own specific actions (or what they see on their own landscape) as being interconnected to larger-scale health of their watershed.
 - Since practices often pay off over the longer-term, this gap may be partially remedied by incorporating both participation and achievements within a given suite of messages. For example: "Nutrient plan development on individual operations increased by 20% and water quality improved by 10% in their watershed". In this way, individuals may be motivated by a sense of contribution, accomplishment and satisfaction gained by connecting their personal actions to benefits achieved at a broader scale.
- The larger-scale benefits of biodiversity, i.e. watershed water supply and habitat, were also less prevalent in the discussion. Since 11% of survey respondents did not correctly answer the question about the small proportion of riparian areas in relation to their contribution to watershed health, building this connection more strongly may be an area for greater focus in messaging.
- Similarly, the practice of keeping lots of birds and wildlife on an individual's property to contribute to watershed health was a challenging idea for 18% of respondents, further suggesting that tying individual actions to the broader scale of the watershed could be an area for messaging to encourage beneficial management practices.
- The most frequently mentioned benefit was recreation/tourism, so individuals were making a link between a more apparent type of human activity and biodiversity – note that aesthetics (beauty) was also mentioned relatively often in the discussion, presumably a factor tied to recreation/tourism, and a potentially appealing element to attract interest in messages about other types of activities/ecological functions.
- The values/economic benefits associated with these activities must be as strongly associated in messaging for other economic activities such as, for example, agriculture, since increased livestock health and increased productivity/profitability were mentioned relatively infrequently in the workshop discussion. For example, 14% of survey respondents did not know how to answer the question relating the idea of proactive management of waterbodies to forage productivity. It is important to balance the notion of benefits accruing from recreation and the seemingly more "apparent" aesthetics associated with those activities, with a wider range of activities

that occur on the landscape, that also have social, economic and environmental value. Indeed, this balancing of benefits can extend to demonstrating that individuals and organizations outside of recreation and tourism contribute, through their actions, to supporting biodiversity, whether they are, for example, rural or urban residents, industrial operators, and/or municipal governments. Further, each can play an important role regardless of where they are located or what they may do. In communicating this balance of roles, costs and benefits, existing barriers to action, whether perceived or real, may be diffused.

Costs (including Barriers)

Workshop Group Discussion

TABLE 11 TOPIC AREA: WHAT ARE THE COSTS OF BIODIVERSITY? (PREVALENCE)				
Item	Prevalence in Discussion			
	<i>many</i>	<i>some</i>	<i>few</i>	<i>none</i>
Pre-defined Items				
i. Importance of biodiversity to you				X
ii. Factors within your control				X
iii. Barriers to you (cost/time/skill/advice/info) ^a				
New Items				
iv. There are no costs			X	
v. Land productivity/operational costs ^a	X			
vi. Costs to industry for clean-up			X	
viii. Lost tax revenue to municipality for “undeveloped” land			X	
ix. Wastewater treatment			X	
x. Education costs due to lack of understanding among public			X	

^a Many examples of operational challenges were identified by workshop participants during this topic’s discussion, but they were not tied to the specific reference to cost of “biodiversity” included in this workshop question. Accordingly, rather than classifying them in this table as “Pre-defined Items” related to the “cost of biodiversity”, they are listed in this table under “New Items (v)”. Examples of operational challenges were primarily related to farming, and included lost land productivity (perceived as long-term but acknowledged by some to be short-term if better management was undertaken); fencing; loss of access to watering areas; costs for culverts and other crossing materials; seed; pasture rotations; labour; and ability to “utilize your land the way you see it would give you benefits”. In itself, this suggests that participants did not make a direct connection between actions/costs that support biodiversity and the actions/costs associated with decisions they make about their operation or the operational realities they must address when trying to make such decisions.

Small-Group Answers

Break-out groups created the following Small Group Answers based on the collective input from all the workshop participants who had rotated to the relevant “question station”.

- “Loss of land, costs and time to develop environmentally-friendly farming practices.”
- “Having to undertake project costs that you usually would not, for the betterment of the environment.”

Survey Agree/Disagree Responses

TABLE 12 TOPIC AREA: WHAT ARE THE BARRIERS TO ENHANCING BIODIVERSITY? (TRUE-FALSE)				
	Agree / Yes % / #	Disagree / No % / #	Not Sure / Don't Know % / #	Total % / #
Financial Costs				
Rural landowners face unfair pressures and costs because of society's expectations about the quality of the natural environment.	57 / 16	43 / 12	0 / 0	100 / 28
Society as a whole benefits from any conservation efforts you make on your place, so society should pay the bill for them.	52 / 14	33 / 9	15 / 4	100 / 27
Wetlands really limit a producer's ability to farm productively and profitably.	7 / 2	79 / 22	14 / 4	100 / 28
Biodiversity is essential to your long-term economic wellbeing.	67 / 18	7 / 2	26 / 7	100 / 27
Ability / Responsibility				
As an individual, you have the ability to play an important role in the health of the watershed you live in.	100 / 28	0 / 0	0 / 0	100 / 28
The current health of the environment on your place is pretty much your responsibility.	82 / 23	7 / 2	11 / 3	100 / 28
Biodiversity is important to you.	93 / 25	0 / 0	7 / 2	100 / 27

Observations and Opportunities

- Interestingly, while benefits of biodiversity were not as strongly associated with agriculture as they were with tourism and recreational uses, the workshop discussion had a strong focus on the cost to individuals due to farmland lost to productivity, and to the price of actions required to protect things like water quality and pasturelands (see also Note (a) on Table 11). Part of the dichotomy may relate to the very idea of biodiversity, since it is a complex concept to grasp in terms of understanding what it is and how it benefits people. Providing specific management recommendations and linking those actions to the relevant benefits will continue to work toward completing that circle of understanding, and help generate the motivation necessary for change, including overcoming some of the perceived negative public response to “not doing it right”.
- Agreement levels on the survey questions relating to financial cost were much more moderate than on the previously discussed questions, with more than half (57%) indicating that there is an unfair financial burden placed on rural landowners.
- However, more than two-thirds (67%) did not see biodiversity as being essential to their long-term wellbeing.
 - This suggests an “incomplete circle”, where costs are viewed as personal and immediate, while benefits are perhaps less relevant, understood or foreseeable. Putting additional emphasis on how to achieve biodiversity without significant cost may help reduce this perceived barrier.
- Individuals indicated a sense of responsibility (82%) about the environment on their own place, a slight disconnect from the previous questions about costs that suggests (a) a level of frustration and (b) potentially not understanding specific low-cost actions that could help them meet their responsibility.
- Given that almost all (93%) indicated biodiversity was important to them, it seems essential to continue to provide information that enables individuals in practical ways to move toward action to meet their management goals.
- The gaps described above may be partially remedied by using the technique of including in a given suite of messages a type of report, status, statement or outcome about the successful implementation of personal management actions and the resulting broader landscape/watershed benefits. For example: “Nutrient plan development on individual operations increased by 20% and water quality improved by 10% in their watershed”. By doing so, individuals may be motivated by feeling a sense of contribution, accomplishment and satisfaction achieved by connecting their personal actions to benefits achieved at both a broader scale and at the personal scale. Where it is possible to report economic benefits that would accrue to the producer or society in general, the message of biodiversity benefits could be strengthened even further. For example, provide a statement like: “The reduced *E.coli* and nitrate levels achieved by improving water quality through nutrient management plans meant that water treatment costs for downstream users was reduced by 10%”. Refer also to the discussion in Section 4 of this report that

highlights the need to continue to link specific individual actions to specific goals at the individual scale.

2.1.4 What are the Threats to Biodiversity?

Workshop Group Discussion

TABLE 13 TOPIC AREA: WHAT ARE THE THREATS TO BIODIVERSITY? (PREVALENCE)				
Item	Prevalence in Discussion			
	<i>many</i>	<i>some</i>	<i>few</i>	<i>none</i>
Pre-defined Items				
i. Cumulative effects		X		
ii. Various human practices (see list starting at (iii))				
New Items				
iii. Community discord/ finger-pointing			X	
iv. Lack of enforcement			X	
v. Pollution/toxicity (leading to human health issues)		X		
vi. Misinformation/lack of information/simplistic solutions	X			
vii. Urban/residential sprawl, and urban upstream impacts	X			
viii. Government policy		X		
ix. Water withdrawals/drainage/clearing of riparian areas/shelterbelts		X		
x. Agricultural practices (over-grazing, misuse of chemicals, improper crop rotations)	X			
xi. Invasive species/weeds			X	
xii. Climate change			X	
xiii. Resource extraction			X	
xiv. Attitude (government and personal apathy, lack of accountability)			X	

Small-Group Answers

Break-out groups created the following Small Group Answers based on the collective input from all the workshop participants who had rotated to the relevant “question station”.

- “Human impact on the natural environment due to lack of knowledge, caring and resources (dollars and leadership).”
- “The major threat to biodiversity is the intensive human impact with lack of proper planning, respect and education for the natural environment.”

Survey Agree/Disagree Responses

TABLE 14 TOPIC AREA: WHAT ARE THE THREATS TO BIODIVERSITY? (AGREE-DISAGREE)				
	Agree/ Yes	Disagree/ No	Not Sure / Don't Know	Total
	% / #	% / #	% / #	% / #
Attitudes				
Alberta has about the right amount of good habitat for fish and wildlife.	11 / 3	70 / 19	19 / 5	100 / 27
Biodiversity is in good shape in Alberta.	8 / 2	61 / 16	31 / 8	100 / 26

Observations and Opportunities

- The group discussion highlighted an interesting theme in that participants first articulated several threats to biodiversity, such as agricultural practices, practices by urban dwellers, and by the government -- being "someone else's doing" and large-scale, rather than individually-based.
 - This suggests that the threats may feel too big or too distant from them, so there would be little each could do as an individual, making it easier to simply target the bigger problems, i.e. finger-pointing at "other people". It can be difficult for an individual to rationalize their small contribution to the larger, even cumulative, impacts they may see around them, and more difficult still to predict and manage if it is perceived that they will become even bigger concerns in the future. Communicating the role of a variety of uses and impacts in a way that links individual negative contributions, and the summed effect of all contributions to environmental impact, can work well. Messaging to agricultural producers may be effective if it also identifies land uses from other contributors and sources. For example, nitrates and *E.coli* from poor manure management, plus municipal sewage, plus industrial releases, sum up to reduced downstream water quality. Given that industrial and municipal releases are closely regulated, if producers can help by meeting appropriate management practices, then everyone benefits.
 - Curiously, however, in later discussion, participants were able to identify specific individual-scale practices (more than 35 in number) that contribute to biodiversity. See also Table 15.
- A potential message focus suggested from these brief observations is to continue to build understanding of cumulative impacts, impacts at different scales, and individual potential roles that contribute to biodiversity because of financial benefits, watershed health, quality air and water, etc. The interconnectivity of these aspects may not yet be sufficiently clear, since a relatively small number of mentions of the concept of cumulative effects were made (the term "cumulative effects" itself was never mentioned), although there was an understanding of discrete threats. See also Table 13.

- These ideas may tend to be supported by the level of uncertainty previously mentioned about watershed scale benefits, and the status of habitat and biodiversity on the provincial scale.
- Concern expressed by participants about water withdrawals from river basins may provide an opportunity to expand on existing cumulative effects messaging related to the water supply, and how biodiversity and healthy riparian areas contribute to that function. For example, the idea that water quality impacts may result in systems that are strained by water withdrawals, if releases are not well managed, can be incorporated into material to demonstrate the multiplier effect of cumulative impact. Such messaging must be combined with simple management actions that will help mitigate such impacts, particularly with widespread use. Again, refer to similar discussion in Section 4 of this report about the need to link specific actions that an individual can take to achieve desired goals.
- One of the most notable discussion points in the workshop was that there is a lack of information/education to assist individuals to take action at the individual scale. This may in part be due simply to lack of knowledge about biodiversity, preventing recognition and use of relevant management practices.

2.1.5 What Can You Do to Enhance Biodiversity?

Workshop Group Discussion

TABLE 15 TOPIC AREA: WHAT CAN YOU DO TO ENHANCE BIODIVERSITY? (PREVALENCE)				
Item	Prevalence in Discussion			
	<i>many</i>	<i>some</i>	<i>few</i>	<i>none</i>
Pre-defined Items				
i. Formal plans (EFP, grazing, cropping) ^a		X		
ii. Techniques to improve habitat, function, etc. ^b	X			
New Items				
iii. Education/info-sharing		X		
iv. Walk the talk, lead by example, co-operate, compromise, be open, be proactive			X	
v. Leave things alone			X	
vi. Enforcement			X	

^a These ranged from large-scale planning efforts including habitat protection zones, wildlife control, residential development plans, watershed protection, through to other efforts that could be undertaken at a variety of scales, such as invasive species control, reintroduction of native species, selective logging and erosion/sediment control including shelterbelts and woodlots, to grazing management plans.

^b These techniques included actions such as variable-rate and direct seeding practices, off-site watering, manure management, electric fencing and off-water winter feeding.

Small-Group Answers

Break-out groups created the following Small Group Answers based on the collective input from all the workshop participants who had rotated to the relevant “question station”.

- “Provide education and awareness of sustainable practices coupled with economic incentives to landowners.”
- “We can have in place grazing management plans including riparian areas where present. Limit impact of non-agricultural activities and promote biodiversity through education.”

Survey Yes/No Responses

TABLE 16 TOPIC AREA: WHAT CAN YOU DO TO ENHANCE BIODIVERSITY? (YES-NO)				
	Yes	No	Not Sure / Don't Know	Total
	% / #	% / #	% / #	% / #
Management Plans				
Do you have a formal integrated crop plan?	14 / 2	79 / 11	7 / 1	100 / 14
Do you have a formal nutrient management plan?	20 / 3	73 / 11	7 / 1	100 / 15
Do you have a formal grazing management plan?	60 / 9	40 / 6	0 / 0	100 / 15
Management Techniques				
Do you use low/zero till and/or direct seeding?	50 / 7	50 / 7	0 / 0	100 / 14
Do you use a flushing bar on your field machinery?	7 / 1	72 / 10	21 / 3	100 / 14
Do you use developed off-site watering system(s)?	64 / 9	36 / 5	0 / 0	100 / 14
Do you adjust the grazing period when forage plants start their regrowth?	73 / 11	7 / 1	20 / 3	100 / 15

Observations and Opportunities

- The need for education and information sharing was stressed again in this discussion, within agencies and organizations but also at the individual scale within communities. The theme of working together co-operatively was mentioned as being important, but was not mentioned a lot. Given that the role of individuals in learning, sharing management information, personal knowledge, and demonstrating a positive approach to proactive management is essential to the Cows and Fish approach, and indeed has marked its success in many communities, this is a theme that should continue to be emphasized strongly.
- Most interesting among survey question responses were those related to individual practices (the various categories of producers completing the survey were asked about only the practices relevant to their type of operation).

- About three-quarters of respondents did not have formal crop plans (79%) or nutrient management plans (73%), nor did they use a flushing bar on field machinery (72%), and only half (50%) used low/zero till/direct seeding.
 - Only 60% had a formal grazing plan, with a similar number (64%) using off-site watering systems. However, almost three-quarters (73%) reported that they adjusted the grazing period when forage plants start their regrowth.
- This tends to suggest that management actions that are required to promote biodiversity are not formalized, and may not be undertaken at all. Given that the need for education and information was stressed more than once in the workshop discussions, program messaging that relates ecological goals to specific practices that can be undertaken at the individual scale are required, an observation noted throughout this report section.

2.2 RELATIONSHIPS BETWEEN TOPICS

Given the low respondent number of 28 on the Baseline Biodiversity Survey, it was not possible to extract any meaningful data relationships between knowledge, attitudes and practices. The attempt to relate agricultural practices to knowledge and attitudes was restricted to an even greater degree, since the number of agricultural respondents was lower again, in some cases only 8 to 15 people. For the sake of completeness, all tabular results of the baseline survey are provided in chart form in Appendix B. No cross-tabulated data are presented in this report that would demonstrate associations or trends in the those data, but for information purposes only, the very few cross-tabulations that were attempted, for example relating to defining biodiversity; use of selected practices; and role and responsibility in watershed/ecosystem health, are shown in Appendix C. It is recommended that the contents of Appendix C not be used to draw any conclusive observations about the respondents.

2.3 SUMMARY

This phase of the evaluation acted as the basis to proceed with the creation by Cows and Fish of new awareness messages addressing biodiversity topics. Section 3 reports on the testing of a proposed suite of messages to deal with apparent gaps in biodiversity knowledge noted here in Section 2, including:

- the relatively low accuracy rating on defining biodiversity;
- the relationship between biodiversity and riparian area health;
- the linkages between long-term benefits provided by biodiversity at a variety of scales and functions that include landscape productivity, watershed-scale health, and personal well-being;
- the apparent disconnect between understanding short-term costs and long-term gain, for example by the ability to recognize that personal actions have both personal and watershed scale benefits, whether positive or negative in terms of biodiversity; and
- the interconnectivity between the role of small-scale actions and cumulative effects on biodiversity.

3. ASSESSMENT OF NEW BIODIVERSITY MESSAGES

Phase B of this evaluation utilized the Follow-Up Biodiversity Survey, completed on-line by workshop participants and other community members including members of local riparian groups contacted by broadcast email, as well as some members of the general public known to those involved in this project. The goal was to obtain feedback on the appropriateness and fit of the set of biodiversity messages newly developed by Cows and Fish, using input obtained in Phase A-Step 1, including assessing whether the new messages were suitable for future use in helping to build knowledge and motivate actions that support biodiversity. The follow-up survey instrument is attached as Appendix D.

Based on Phase A-Step 1 feedback, new messages were categorized under principles central to the Cows and Fish program, as summarized in Table 17, namely (i) developing awareness and (ii) promoting practice change. Results are presented under these two principles, in Sections 3.2 and 3.3 below.

TABLE 17	
CATEGORIZING POTENTIAL MESSAGING	
Program Principle	New Message Focus
Developing Awareness (knowledge)	Building an understanding of biodiversity Addressing misconceptions / barriers Clarifying key components of biodiversity (including relationships to riparian/watershed health)
Promoting Practice Change	Linking to management practices based on a sound understanding of biodiversity and riparian health

3.1 PARTICIPATION AND RESPONDENT DEMOGRAPHICS

The demographics associated with the Follow-up Biodiversity Survey respondents are as follows.

- Among of the 104 respondents who identified a primary occupation, just under half (48%) indicated watershed/natural resource management professional. Twenty percent reported their primary occupation as being in research/education or communications, while 10% indicated their occupation was farmer or rancher. The remaining 22% reported occupations in resource extraction (1%); other industry (3%); retail and services (3%); professional services (7%); and other miscellaneous occupations (8%). See Figure 1.
- Among the 104 respondents who identified their type of primary residence, about three-quarters (74%) indicated a non-agricultural home, whether in a city, town or village. Fifteen percent indicated their primary residence was an agricultural operation/home, with 8% indicating country residential or acreages homes. Three percent indicated "other". See Figure 2.

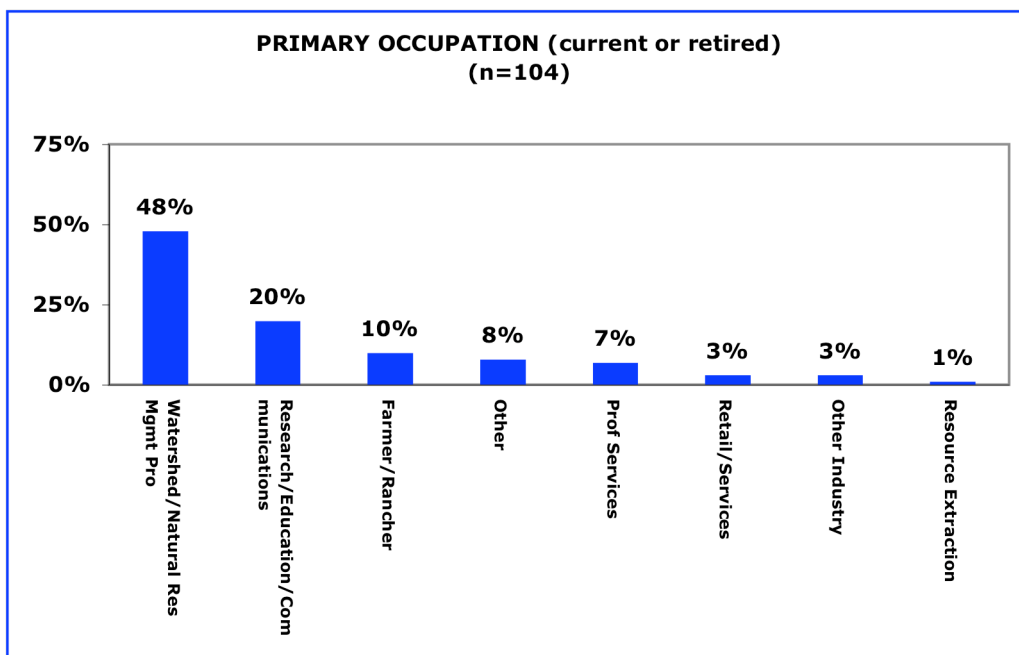


Figure 1

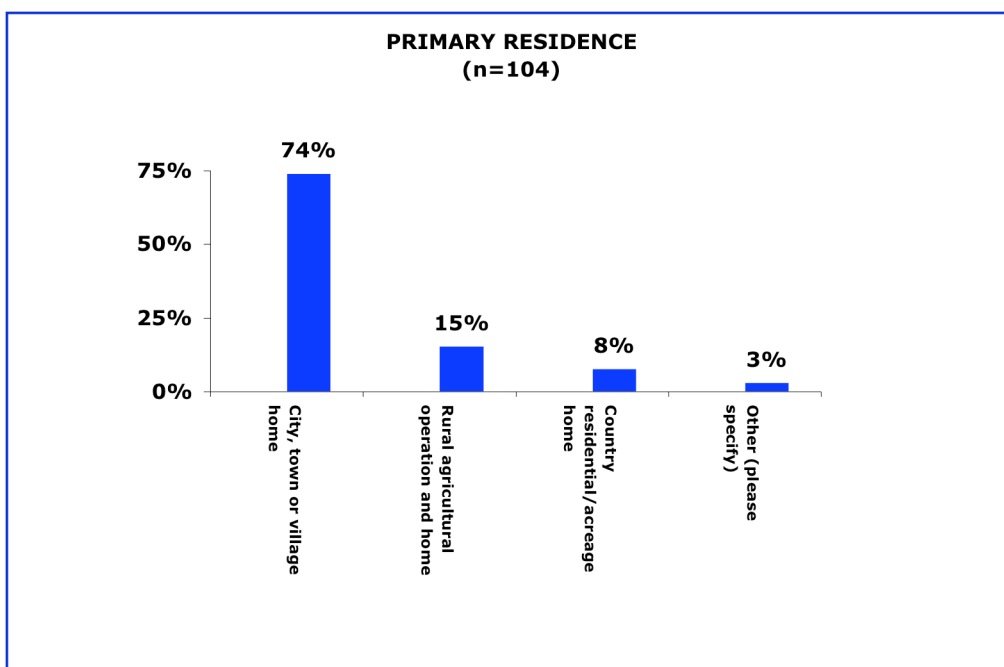


Figure 2

- Among the 22 respondents who identified their type of agricultural operation, half (50%) were primarily livestock producers. Eighteen percent indicated “other”, while the remainder were primarily crop farmers (14%); mixed farmers (14%) and specialty farmers (4%). See Figure 3.
- Among the 104 respondents who identified how much contact they had had with Cows and Fish, 9% indicated a lot of frequent or in-depth contact; 42% indicated they had had moderate contact; 33% indicated they had had very little contact; and 16% indicated they had had no contact with Cows and Fish prior to completing the survey. See Figure 4.

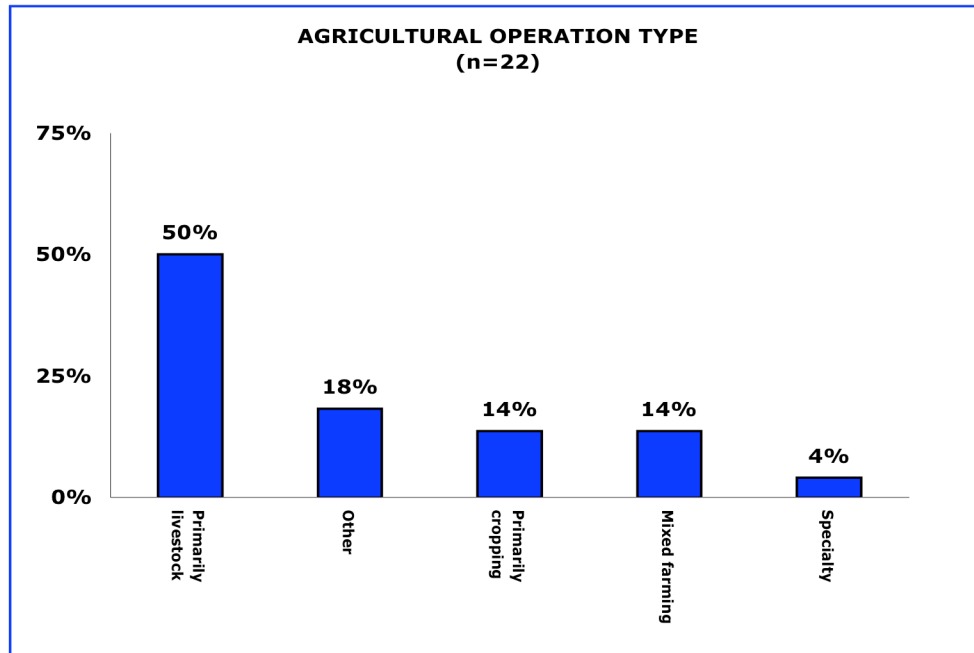


Figure 3

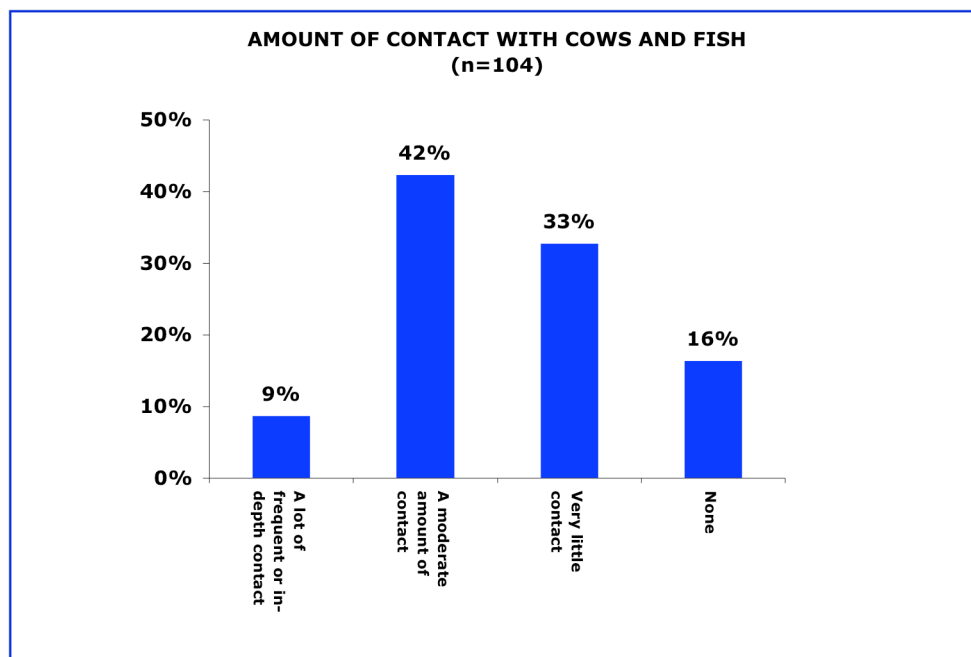


Figure 4

3.2 DEVELOPING AWARENESS

3.2.1 Biodiversity of Native Species Moderates Ecosystem Resiliency and Disturbance

Survey Question It is generally recognized that the more diverse an ecosystem is, the more stable, more resilient and better able it is to respond to disturbance (e.g. drought, flood, disease, etc.). So, a healthy landscape with many different native species is generally a good thing. Which of the following statements gets across this idea most effectively?

Statement # (reported order of preference)	TABLE 18	Random Order Used on Survey
1	A healthy landscape with many different native species is generally a good thing because it is more resilient and better able to respond to natural disturbances or changes.	3
2	More diverse ecosystems are more stable, more resilient and better able to respond to disturbance such as drought, flood or disease, and so a healthy landscape with many different species is a good thing.	2
3	Healthy, diverse ecosystems are more resilient to natural disturbance.	1

Tabular Results

The most preferred message wording (referred to here as Statement 1) among the three randomly-ordered statements on the survey, was chosen by just under half (46%) of respondents. The next most preferred wording option (Statement 2) was chosen by about one-third (31%) of respondents, while less than one-quarter (23%) selected the third option (Statement 3). See Figure 5.

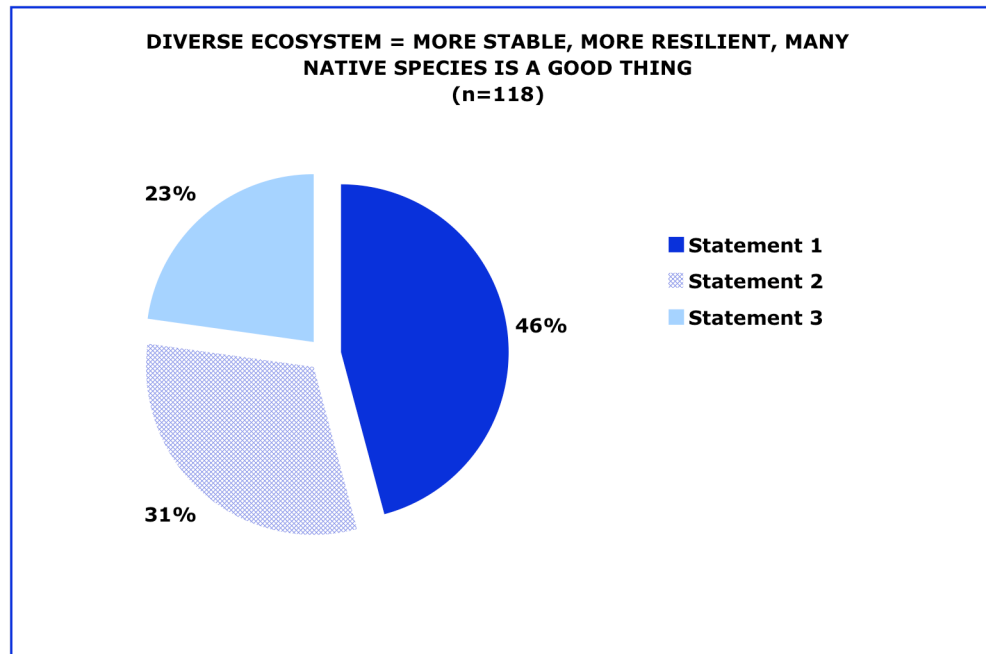


Figure 5

Respondent Comments

First Preference for Wording (Statement 1 = 46%)

- A healthy landscape contains many different native species and is more resilient to natural disturbances.
- All are too "wordy".
- Also extreme events, which can be extremely damaging!
- Audience is key: even "resilient" may need to be explained for why it matters.
- Diverse ages is also important not just diverse species. I chose this one because it specified "native", the first one was my other choice.
- Does "stable" mean resistant to change, and "resilience" mean recovery after disturbance? Stability and resilience are two different concepts to me. I don't like the term "a good thing", but the first choice does not provide sufficient detail.
- How about ... "Land with many different native species is generally a very good thing because it retains a capacity, a resiliency, to adapt and respond to natural disturbances or changes."
- I suggest removing the words " is generally a good thing because" from the

statement. I also like the disturbance examples given in choice #2.

- I am not sure what grade level this is written to, but I understood grade 6 was about right for public consumption.
- I like emphasis on native species: invasive plant species increase biodiversity, but aren't necessarily a "good thing".
- I would add examples of drought, flood etc. from the second statement to the third.
- Mention of native species is very important.
- Perhaps add "such as drought, flood or disease" to the end of this statement.
- Simpler is better, for example healthy landscapes with many different native plants and animals can withstand natural disturbances.
- Simpler language; although less complete definition, likely easier to be understood by general public.
- Suggest preferred statement be expanded to say... changes such as drought, flood, fire or disease.
- Technically the others may be better - but how understandable are they to the layman? For example, awareness of what an ecosystem is. Maybe add "such as drought, flood or disease" to the last one.
- The first is too simple, the second tries to say too much at once, the third is a good compromise. It might be even better if it started with "a healthy ecosystem".
- Too short does not explain enough; too wordy and you lose your audience.
- Why only "natural" disturbances? Suggest remove "natural" and the "or changes" at the end. What is the difference between natural and anthropogenic disturbances in terms of resilience?
- Words such as "diverse ecosystems" are not understood by all. "Landscape" and "different species" or "variety" are better word choices.

Second Preference for Wording (Statement 2 = 31%)

- As landowners usually are owners of livestock, you may want to consider the benefits of financial gain being clean water for livestock, better range management = more grass. If this is covered later, great, just didn't want to miss it.
- Find different word in place of resilient.
- I would add in the second statement something along the lines of " ...wo [sic] a healthy landscape with many different NATIVE species ...".
- More than minimal detail is better. Good idea to provide some rationale with blanket statements. Perhaps note that healthy ecosystems are more resilient to un-natural disturbances, too.
- The second one is best but could be shortened.
- To me, in "...generally a good thing..." the word "generally" implies there are situations where it may not be a good thing.
- To the novice one has to be specific.
- You are using some pretty big words.

Third Preference for Wording (Statement 3 = 23%)

- Could you find a better way of saying "a good thing"? Why are diversity and resilience "good"?
- Healthy, diverse ecosystems are more stable and resilient to land uses and natural disturbances.
- I selected this option because it is the most concise. The other two options I found were worded poorly.
- It's also important to note that healthy diverse ecosystems are more resilient to ANTHROPOGENIC disturbance TOO.
- No one is going to read the longer more detailed paragraphs (standalone).
- Point shouldn't ramble and lose the gist. The first one is not as informative, but shouldn't lose the reader.
- Simple statements are more direct and easier to remember. Too many words and the message is lost.
- The first sentence is the most concise and simplest of the three. You could add, after "disturbance" "such as drought, flood, or disease" to specifically suggest what natural disturbance might be.
- The second and third bullets are way too wordy. The messages are lost.
- The second one has poor grammar, and the third sounds weak "generally".

3.2.2 Biodiversity at Risk in Alberta

Survey Question In our recent Cows and Fish survey, almost one-third (31%) said they weren't sure or didn't know whether biodiversity is in good shape in Alberta. In many ways and in many places, it is not. Which of the following statements most clearly communicates that biodiversity is at risk (that is, that it's not in good shape) in Alberta?

Statement # (reported order of preference)	TABLE 19	Random Order Used on Survey
1	The greatest threat to biological diversity is loss of space and quality habitat due to intensive use (urban, recreational, industrial or agricultural), development, land-clearing or land conversion. With no place to exist, it's pretty hard for plants and animals to survive.	1
2	Alberta has numerous endangered and threatened species, mostly due to loss of habitat -- not enough suitable places left to live means these species are at risk of disappearing.	3
3	Many walleye and northern pike populations in Alberta have crashed due to over-fishing -- there are simply more fish taken than their populations can replace, which has led to changes in the fishing regulations to try to assist populations to recover.	2

Tabular Results

The most preferred message wording (referred to here as Statement 1) of the three randomly-ordered statements on the survey, was chosen by almost two-thirds (61%) of respondents. The next most preferred wording option (Statement 2) was chosen by about one-third (35%) of respondents, while very few (3%) selected the third option (Statement 3). See Figure 6.

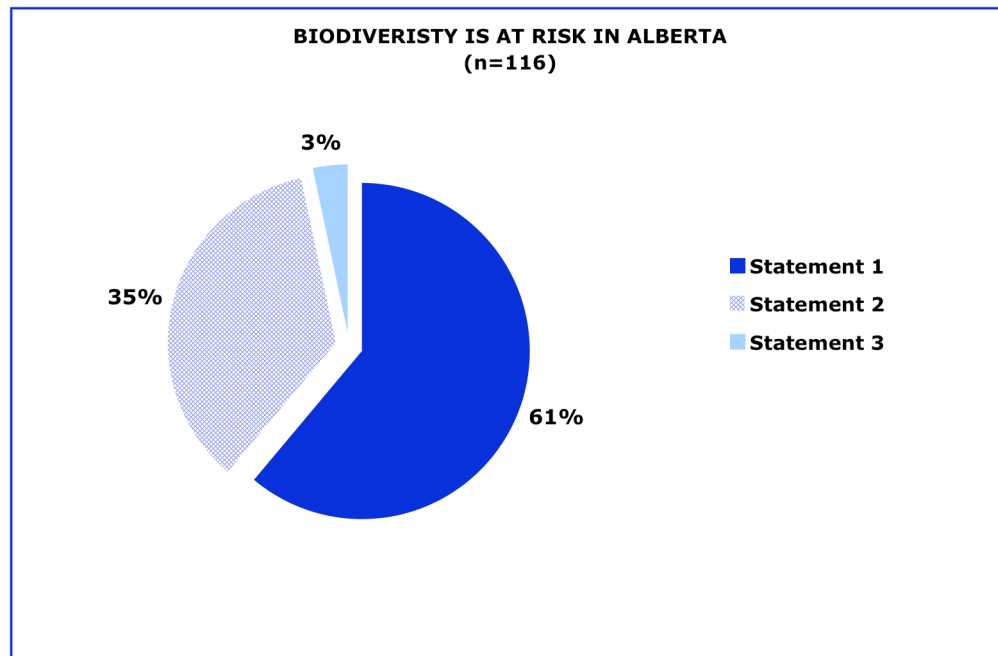


Figure 6

Respondent Comments

First Preference for Wording (Statement 1 = 61%)

- #1 is the best but the first half of the statement still needs to be simplified.
- 1 or 3.
- Are we trying to highlight habitat loss as a threat assuming people care about loss of biodiversity? For example, habitat loss from human development is the greatest threat to biodiversity. Losing biodiversity means losing healthy landscapes, which impacts people.
- Biodiversity is being lost when the environment is destroyed - intensive land use.
- Comment #2 omits the issue of continued over harvest by commercial anglers, and comment #3 does not address the issue of non-natives and their impacts which in many places is more of an issue that habitat loss, additionally non-natives tend to flourish in disturbed areas.
- Explains what, who, why and where.
- First one is ok - last two do not really speak to biodiversity at all.
- I think this sums the situation up in better detail and at the appropriate scale - the

- other points focus on only one aspect of the problem.
- I would make this option shorter though by just saying "...due to intensive land use or land conversion. With no place..." I think development and land-clearing are still captured with this briefer statement.
 - I would suggest replacing the expression "biological diversity" by "the diversity of Alberta species".
 - It's time people realize that all natural ecosystems are threatened, not just SAR; however, the statement that begins "The greatest threat..." does not impart that biodiversity has already been lost.
 - Last sentence, option 1: "With no place to exist, plants and animals CAN'T survive"! Other options are a bit too specific: it's about common species as well as endangered ones.
 - Loss of biodiversity also threatens humanity and a quality standard of living and lifestyle.
 - Second one may cause a defensive reaction in audiences. I like the last sentence in #1.
 - Short sentences have more punch!
 - Should read "and quality habitat due to increased urban, recreational, industrial, agricultural development". With no place to exist...
 - Straightforward, covers most of the general causes.
 - The fact that you refer to "biodiversity" as if it were a thing ... i.e. it's not in good shape (as if it had a shape) ... helps to lead to the confusion of what it is. Biodiversity is a term that reflects variety of species and quite simply biodiversity is NOT at risk... something that is living can be at risk... biodiversity can be reduced which simply means the numbers and variety of species is being reduced. How about... "The prime cause of lost biodiversity (reduced biological diversity) is the loss of space and suitable habitat. The agents of change are intensive human land use actions such as urbanization, land-clearing and industrial development. With no suitable place to exist, plants and animal species disappear, and biodiversity is reduced."
 - The last sentence of the point above may not be required. It may be redundant.
 - The rich variety of Alberta's plants and animals is at risk due to... get away from the ecologist's jargon for god's sake.
 - The threat is to all biodiversity, it is dangerous to say endangered or threatened species as people do not know which ones these may be.
 - While the fishing comment is accurate it is not near as important in the biodiversity scheme of things as the first one.

Second Preference for Wording (Statement 2 = 35%)

- Could also bring in the aspect that there are many other species just “waiting in the wings” to be listed.
- I don’t like the specifics of the second option and the first is not clear that this is specific to our province.
- I would be more direct. Say "Alberta's biodiversity is decreasing and more plants and animals are becoming at risk of population declines. The main threat is loss of suitable habitats, such as native grasslands, to development, cultivation or invasive weeds."
- Replace the word "numerous" with "many". Add the words "from Alberta" to the end of the sentence.
- Very direct and to the point.

Third Preference for Wording (Statement 3 = 3%)

- The second statement provides a concrete example (walleye) of how. Otherwise a combination of the first and the last from "Alberta has numerous endangered... mostly due to loss of places for them to live (habitat) as a result of man-made changes to the landscape for agriculture, industry and urban development"??

Not Classified

- I think if you should say "Biodiversity is not currently in good shape in Alberta, this puts many wildlife species at risk".
- Why choose one over the other when they are both true, the way you choice them out here, you are making one issue appear to be land and the other water; shorten and combine the two.

3.2.3 Birds and Wildlife Help Health of Watersheds and Ecosystems

Survey Question About one-fifth of those recently surveyed said they did not know (or weren't sure) if keeping a lot of birds and other wildlife on their place also helps keep their watershed in good shape. Generally, a local area that supports lots of native birds and other wildlife is a healthy functioning ecosystem, compared to an area that doesn't -- meaning that the surrounding watershed is also more likely to be healthy. Which of the following statements gets across this idea most effectively?

Statement # (reported order of preference)	TABLE 20	Random Order Used on Survey
1	Having lots of native birds and other wildlife on your place is a good indicator that you are managing for a healthy landscape and watershed.	2
2	Fish and wildlife rely upon good quality habitat and functioning ecosystems to survive -- they can be good indicators of a healthy watershed.	1
3	Landscape integrity or health results from good management and land use decisions -- a healthy watershed will have a diversity of wildlife.	4
4	A healthy watershed means the landscape is functioning in many ways, including supporting a diversity of native wildlife.	3

Tabular Results

The most preferred message wording option (referred to here as Statement 1) was chosen by just under one-half (48%) of respondents. The next most preferred wording option (Statement 2) was chosen by about one-quarter (26%) of respondents, with the remaining two options together being selected by the remaining one-quarter (25%) of respondents (Statements 3 and 4). See Figure 7.

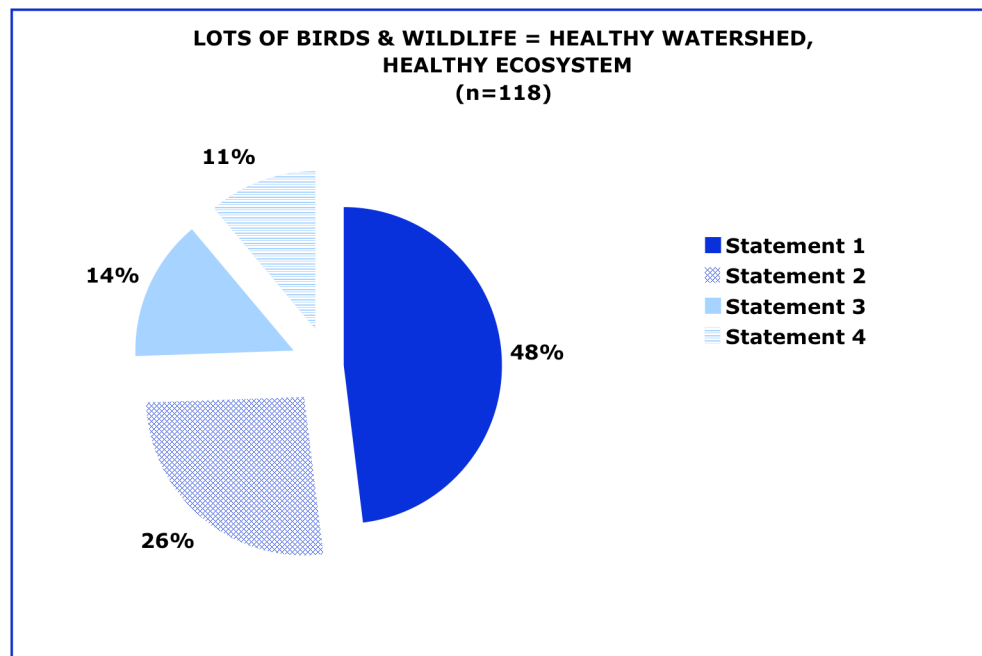


Figure 7

*Respondent Comments*First Preference for Wording (Statement 1 = 48%)

- A good measurement tool that everyone can see for themselves.
- As with the previous two questions all of the options do a pretty good job of making the point.
- Do you want to promote the birds or the root cause of why there are or are not birds?
- I think the key is to use the emotional connection to motivate good management and to find indicators of good management that most people will be able to observe easily. This statement offers something for everyone (wildlife and birds offer many options for people to latch onto) and gives them an easy indicator to watch for.
- It's personal - encourages personal action and feeling of positive contribution to healthy landscape. The others have more technical language.
- It's too bad that so often you have to resort to anthropomorphic words but it is understandable to communicate with the public. Talking about a "healthy" landscape and "healthy" watershed makes it sound like landscapes have health. I understand the intent. I guess it's OK. An alternative way to make the statement avoiding anthropomorphism... "Having lots of native birds and other animal and plant life on your place is a good indication that you are managing well ecologically with a conscious effort to maintain or enhance biodiversity."
- More personal...more effective.
- Once again, need to be direct. "Watershed health" means nothing to most people but saying that native birds indicates this clearly tells them what to look for.
- Only one option answers the question. Need to stress the importance of NATIVE species as an indicator of watershed health.
- Simplify? Many people don't really know what a watershed really is... for example, more native birds and other wildlife means healthier landscapes.
- Suggest you amend the preferred statement to say "Having a diversity of native bird and other wildlife populations is...". Simply saying "lots" of native birds does not necessarily indicate a diversity of birds or other wildlife. Your indicator is diversity.
- The second choice is simply written with easy to understand words.
- The second one is direct, easy to understand yet not over simplified.
- The word "wildlife" is becoming a difficult word to use in Alberta. Many landowners associate this word with deer and other crop damaging animals. This is unfortunate since wildlife actually refers to birds, insects and many other beneficial species. I think it would be worth looking at using the word "animals" or perhaps a word like "organisms" instead of the word "wildlife".
- Unless it is due to less area in which to congregate.
- Want to emphasize role of lots of wildlife as both cause of health, and consequence of health? Otherwise might confuse.

Second Preference for Wording (Statement 2 = 26%)

- Humans too.
- I think "landscape integrity" might require definition. I don't think that the statement should assume that the watershed is being managed well just because there are animals present.
- Just explains better than the other three choices.
- Or the third category.
- The fourth one is pretty good too. #1 simply describes what a healthy ecosystem might look like. #4 concerns management of ecosystems.
- The last one would be my second choice "Landscape integrity or health...".
- Very clear. The others bring in some other issues that are important but disrupt the clarity of your point.

Third Preference for Wording (Statement 3 = 14%)

- I also like the second statement. It speaks about individual decision/actions and is more personal. On the other hand statement 4 can address both individual and communal decisions/actions in the watershed. One problem with statement 2 is that the wildlife and birds might also be found on someone's place because it is their last refuge: thus the rest of the watershed is not healthy. The link between landscape health and wildlife diversity is less clear or true in statement 2.

Fourth Preference for Wording (Statement 4 = 11%)

- I liked this comment best as it mentions native wildlife, the trick is to get people to recognize "Native" wildlife.
- This is a more inclusive answer, includes water quality.

3.2.4 Biodiversity is About Interactions More Than Numbers

Survey Question One of the common misconceptions about biological diversity is that it's simply about numbers -- that it's better to have more and more individual plants and/or animals (even of just one kind). Many people do not understand that biodiversity is the unique group of organisms, and the interactions they have with each other and with their environment, that are important. Please select the description of biodiversity that does the best job of clearing up this misconception.

Statement # (reported order of preference)	TABLE 21	Random Order Used on Survey
1	Biodiversity is about more than counting how many plants and animals there are. It's about the complex mixture of plants and animals that a healthy landscape supports, that interact and that are interconnected.	3
2	Biodiversity is not just about counting how many plants and animals there are. It's about the complex web of plants and animals that an ecosystem supports, with each one relying upon many others.	1
3	Biodiversity is not just about counting how many plants and animals there are. It's about the complex web of plants and animals that an ecosystem supports when it is healthy -- there may be lots of some kinds of species and a few of other kinds of species.	2

Tabular Results

The most preferred message wording option (referred to here as Statement 1), was chosen by just over one-half (52%) of respondents. The next most preferred wording option (Statement 2) was chosen by about one-third (34%) of respondents, with just 15% choosing the remaining option (Statement 3). See Figure 8.

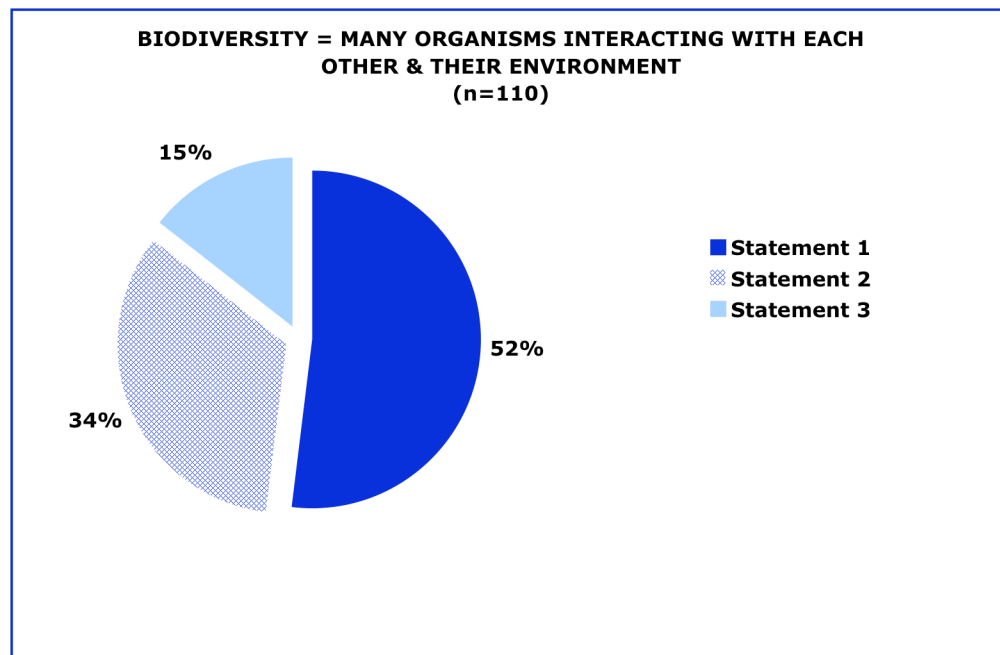


Figure 8

Respondent Comments

First Preference for Wording (Statement 1 = 52%)

- Another point is that determining healthy biodiversity also requires consideration for which species are present. Invasive species, for example, do not indicate healthy biodiversity.
- Biodiversity is at three levels: species, landscapes, and genetics.
- Definitely the best choice in my mind.
- Explains it the best.
- I suggest replacing the phrase "complex mixture" with something like "abundance and distribution". Should microorganisms also be mentioned?
- I think it is important to have the word "interact" in this statement.
- Maybe you can add "All of the plants, animals and microbes together with the non-living part of the landscape make up an ecosystem".
- Should more simply read ... "Biodiversity is about more than counting how many plants and animals there are although a greater number of species is usually significant. It's also about the complex mixture of plants and animals and how they interact and remain interconnected."
- Third is best but could still use some refining.
- This is very complex! Biodiversity is not just a numbers game - it's about the many processes and connections between all the living things that make the landscape healthy.
- Where is the word "variety" in any of this? Language needs to be simplified!!

Second Preference for Wording (Statement 2 = 34%)

- "It's about the number of different plants and animals that an ecosystem supports, with each different species relying on the others for survival."
- An ecosystem IS (in part) the plants and animals.
- Easier to read.
- None of them really do it for me. I think that 1 and 3 are very similar as the overview of biodiversity but the 2nd one is homing in on one of the other manifestations of biodiversity (but does not include genetic variation within species, etc). I like the first sentence of the third one "Biodiversity is about more than....". They all require further elaboration (examples) and don't easily stand on their own. The last part of the last statement, after the comma, doesn't seem to flow.
- The sense of relying may be seen as a bit anthropomorphic in sentiment, but I think it works better than the others.
- There is "biodiversity" in any landscape, healthy or not. There is likely more in a healthy ecosystem.

Third Preference for Wording (Statement 3 = 15%)

- I would incorporate the idea that biodiversity exists at three levels (species, ecosystem, and genetic).
- Should use the word "variety" instead of "complex web" (...It's about the variety of plants and animals...).

Not Classified

- I don't really like any of them. The problem is that you can have a lot of animals of several common species that have adapted very well to man's changes to the environment - skunks, magpies, crows, house sparrows for example, but lots of these individuals doesn't translate to a healthy environment, for many other species could have been displaced and are gone.
- Might need to say "evaluating?/monitoring for?/assessing?" biodiversity.
- None of the above, just explain biodiversity is a complex group of organisms, plants and animals that rely on each other for existence. If any one link is broken, the whole chain suffers.

3.2.5 Biodiversity is For Some Other Place

Survey Question Some people have the idea that biodiversity is just for parks or some place else, but not where they live. Please rank the following four statements on their ability to clear up this misperception by showing that having biodiversity all around us is important.

Tabular Results

The ranked order of preference for the four message options is illustrated in Table 22.

Statement # (reported ranking)	TABLE 22	Random Order Used on Survey
1	We can create homes for native plants and animals all around us - - in our cities, on our farmland, and in industrial developments. Everywhere around us there are opportunities to allow and encourage native plants and wildlife. <i>(n=111, selected as first by 41% within this option)</i>	4
2	We can create homes for native plants and animals all around us - - in our cities, on our farmland, and in industrial developments. If we don't support biological diversity all around us, the few we save will be those things that can live on little islands of habitat, a bit like saving those things that can survive in a jar or in a fishbowl. <i>(n=111, selected as second by 30% within this option)</i>	3
3	Most wildlife rely on plants to create homes or habitat, so supporting biological diversity can start with ensuring that we have native plants, whether in our backyards, industrial areas or fields. <i>(n=112, selected as third by 32% within this option)</i>	1
4	We need to create homes for native plants and animals all around us -- in our cities, on our farmland, and in industrial developments. Otherwise, the little we have in parks will be like relegating all native plants and animals to exist in some open-air zoos. <i>(n=111, selected as fourth by 38% within this option)</i>	2

Respondent Comments

The following comments cannot be categorized according to the ranked choices made by the respondents, each having made four selections within the same question, and so the comments are provided in alphabetical order.

- "Misperception?" Sounds like a made up word by a bureaucrat. I am trying to think of a wildlife species that doesn't rely on a plant for a home or food. Certainly even parasites indirectly rely on plants for their hosts. The concept you are putting forward is a good one and one that industry often has a difficult time grasping - wildlife need to be able to use land everywhere. I think the emphasis

should be on retaining habitat for *[sic]* to recreates a destroyed landscape is very expensive and difficult.

- First - perhaps add "in our backyards" before in our cities...
- I don't really like the third or fourth options.
- I like to see the more positive comments.
- I would tailor the message for the urban resident vs. industrial vs. farm audience. For example, the ecosystem/landscape doesn't stop at your sidewalk/fence - you can make your yard/industrial area (?)/field home to native plants and animals.
- Much to recommend emphasizing the "everywhereness" of the components of biodiversity.
- My ordering is based on your explicit reference to wanting to address the "parks" type issue; "create" should be expanded to include "maintain" or "protect" otherwise the scenario seems a bit bleak.
- Short, clear and concise.
- The fourth statement is more positive. The second and third options suggest reasons for maintaining native habitats.
- The last statement is by far my favorite!
- The point is that if an environment with a large rather than small variety of plants will have more, different animals, birds, insects, etc. and be more diverse.
- The second one should end in "...exist in open-air zoos" or "...exist on some open-air zoo."

3.2.6 Misperception That Wildlife Can Just Move Elsewhere

Survey Question There is a widely-held perception that if development occurs in one area, there's a lot of room for wildlife to move somewhere else. This is very often not the case. Does the following statement correct this misperception?

Statement #	TABLE 23	Random Order Used on Survey
1	When we clear land for homes, fill in a wetland for a road, or plant a crop where native prairie used to be, the wildlife that relied on those areas can't just move to another spot. Those other spots, if there are any suitable ones, are usually already full, and if they aren't, it's usually because they aren't suitable for supporting that wildlife. Just like in our society, the good spots fill up first, and the substandard ones are left for last.	1

Tabular Results

Almost all respondents (88%) indicated the wording addressed the misperception, with 12% indicating the wording does not alleviate the misperception. See Figure 9.

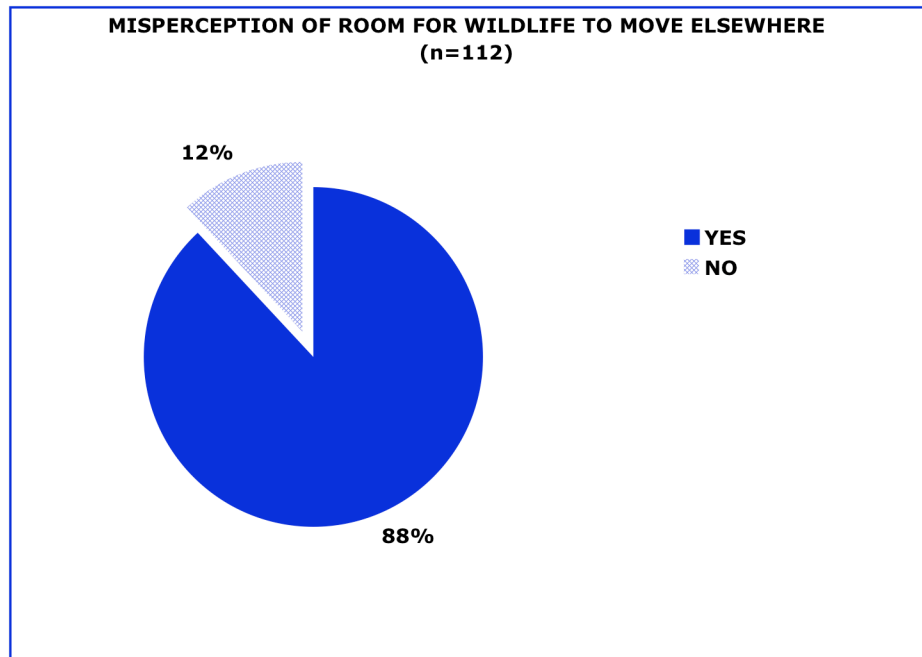


Figure 9

Respondent Comments

About "Yes" Choice

- ... the alternatives could be too far away, could differ in subtle but crucial respects... physical relocation is not usually a viable option...
- Any way to use an analogy here?
- Crowding can create opportunities for disease. Also, not sure the society analogy helps... alternative?
- Good concept to explain.
- I don't like the "just like in our society" analogy.
- I suggest using the word occupied instead of full on the 4th line.
- I think there could be a comment on fish here, as they are typically more impacted by barriers. A comment to the effect that barriers are equal to dams on rivers that fish cannot navigate beyond. This can be clear to readers. And that when habitat is created to offset losses it is often changed in functionality.
- I think you need to clarify "full." Full of what?
- I thought the last line isn't quite effective enough.
- I'm not sure if the last sentence is even necessary.
- Is the last sentence necessary?
- It's a bit like having refugees displaced from their homes... where will they go and what will they do? It will never be the same for them...
- Makes me feel ashamed for our human arrogance - perhaps a culling program for us? (Joke.)
- Many times non-native species have filled areas where native ones might have

moved to.

- Maybe some chance to talk about need for corridors to connect areas of suitable habitat.
- None.
- Partly. I think it would be good to mention how fragmented our habitat is getting. Cities, road, petroleum exploration and other forms of development are cutting up the landscape for larger animals. This makes it hard for some animals to get around in their search for food, mates, and territory. Look at the fence in Banff National Park. And, some of the space left is compromised due to noise, visual disturbance, water quality issues, etc., etc.
- Pretty wordy, I had to read the statement a few times.
- This statement does not get across the message that in the long-term wildlife populations will not be sustainable since any area can only support a specific population amount.
- To some degree. I think we need to look at relocating an entire interconnected community

About "No" Choice

- "Just ask yourself - what would happen to me if my house burned to the ground along with all our neighbours?"
- Already full of what? Clarify. Also, some wildlife cannot survive outside their specific habitat. Last sentence in above statement not especially useful.
- I checked no because again, it way too wordy and the messages are lost replace words like society and substandard with something like: "just like a city, the good spots fill first, and only the poor areas are left..." and you don't need the "if there are any suitable ones".
- It is getting close but the second sentence needs some work.
- It misses the point that previous loss of habitats removes the opportunities for wildlife to move - it seems focus on wildlife making "choices" rather than describing why wildlife has to make a choice.
- Needs to be simplified.
- Should speak to the fact that many of the species affected depend on native habitat such as native prairie and simply cannot adapt to living in a monoculture for example or a storm water pond as opposed to a wetland.
- The first sentence is great. I believe the second sentence should read, "Those other spots are either unsuitable, or already full." Then you can add something like "A beaver, for example, cannot move into a field, nor can it move into a suitable stretch of stream if it is occupied by other beavers".

Not Classified

- "In today's world, the idea that there is somewhere else to go is no longer valid."

3.3 PROMOTING PRACTICE CHANGE

3.3.1 Biodiversity Doesn't Mean Conflict / Cost

This misperception was addressed by two questions providing suggested wording. The first question was directed to non-agricultural respondents and the second was directed to agricultural audiences.

Survey Question **(NON-AGRICULTURAL AUDIENCES)** Some people feel that protecting biodiversity means conflict, giving something up, or that it is too costly. Does the following description alleviate this concern?

Statement #	TABLE 24	Random Order Used on Survey
1	When we make choices in our land use management that increase biodiversity, we also increase the resiliency and sustainability of our land and water so they can respond better to changes. This resiliency can give us cleaner water, more recreational opportunities, and healthier communities for people. We can encourage a healthier landscape with even small changes to our actions such as letting lakeshore plants grow in a previously mowed shoreline, reducing our use of water in our homes and yards, and planting native plants in our yards.	1

Tabular Results

Among non-agricultural respondents, 83% indicated that the proposed message for their audience type alleviated the misperception, while 17% indicated that it did not do so. See Figure 10.

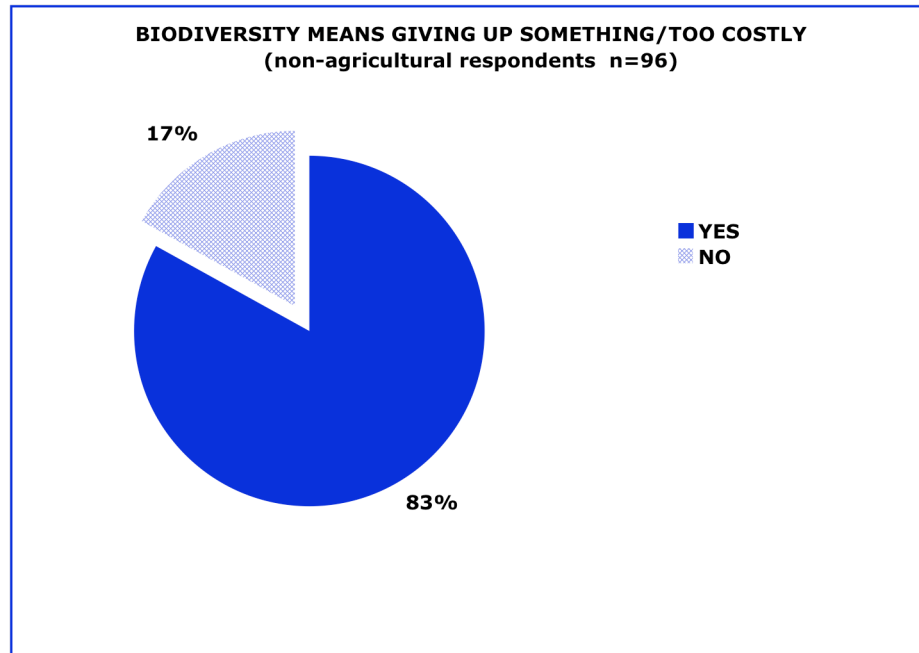


Figure 10

Respondent Comments

About "Yes" Choice

- But the lead-up is a bit long. If the point you are trying to make is the last sentence, I would recommend getting to it sooner.
- Can simplify, for example, we all benefit from managing healthy landscapes - from cleaner water, more recreational opportunities and healthier communities for people. Everyone can make decisions - big and small, at home or at work - to create healthy landscapes.
- Could mention that variety is also aesthetically pleasing, such as in a yard or park. (Plants, rocks, shrubs, etc. instead of all grass.)
- I agree with this comment.
- I am *[sic]* agriculture producer and I feel this comment applies to me as well.
- I think to some degree this statement alleviates the concern, but it seems to me larger scale development on previously undeveloped land could bring about this conflict.
- I think you should explicitly say that it is easy to save time and money while protecting biodiversity. Try something like, "we can save time and money while encouraging a healthier landscape, even through small changes such as letting lakeshore plants grow..."
- I would remove the word "can" from the two sentences: "This resiliency can give us..." and "We can encourage..."
- It is a starting point at least.
- It may alleviate their concerns, but implying that biodiversity conservation can be

accomplished through small changes with no significant tradeoffs is wrong and may ultimately prove to be counterproductive.

- It works, but again it's too long and too wordy. Language has to be accessible.
- Last sentence should be first - the idea of even small changes counting.
- Protecting riparian areas from grazing. Do try to find a clearer (simpler) word to replace resiliency.
- Reducing the amount of water used in our homes does NOT increase diversity.
- Some people will not believe this. They will still question cost, how this can give cleaner water, recreational opportunities, etc.
- Sustainability beats intensive and only intensive means making stark choice.
- The term "land use management" is awkward and consider using "our use of the land".
- Very good.
- Yes, but it's a little weak.

About "No" Choice

- Also want to maintain biodiversity as well as increase. I like the 2nd and 3rd sentences.
- Does not address potential economic benefits over time relating to a healthy landscape or the downside of a degrading landscape over time.
- I didn't feel that the solutions given would have a large enough impact on those reading this paragraph, to make them think that they should be making a real difference. Perhaps stating something about more beneficial grazing rotations, and how these actions could actually help them to make more money.
- I guess that resiliency doesn't speak to me but maybe that's because I'm an environmentalist.
- Suggestions: When our land management choices result in richer biodiversity. Resiliency of "land and water" is a difficult concept - can water respond?
- The statement defines a positive and proactive viewpoint and option; it does not really address the conflict issue that you say you are trying to tackle.
- This only partially alleviates the concern, specifically the concern over one's own backyard. The bigger picture concerns, which may have bigger impacts, still remain, things like should clear-cutting continue, should the oilsands development proceed. I think people will fight biodiversity protection measures to save the jobs these big things bring, and not realize we can do development AND do biodiversity protection.
- Why would a farmer think a more "sustainable" landscape is worth the costs of doing business differently, especially if doing business differently will cost more in the short term?

Not Classified

- Or not mowing the plants in the first place.

Survey Question **(AGRICULTURAL AUDIENCES)** Some people feel that protecting biodiversity means conflict, giving something up, or that it is too costly. Please select the description that best alleviates this concern.

Statement # (reported ranking)	TABLE 25	Random Order Used on Survey
1	When we make choices in our land use or management that increase biodiversity, we increase the resiliency and sustainability of our land and water. We can encourage a healthier landscape with even small changes to our management such as using off-site waterers, moving salt away from water, or leaving stubble in a crop field.	1
2	Pastureland with more litter or carryover is less likely to suffer winter kill, is better able to respond to drought, and provides a more stable and reliable forage supply -- in addition to providing habitat for wildlife and plants.	2

The most highly ranked agricultural message wording option (referred to here as Statement 1) was chosen by 74% of respondents. The lower ranked wording option (Statement 2) was chosen by the remaining one-quarter (26%). See Figure 11.

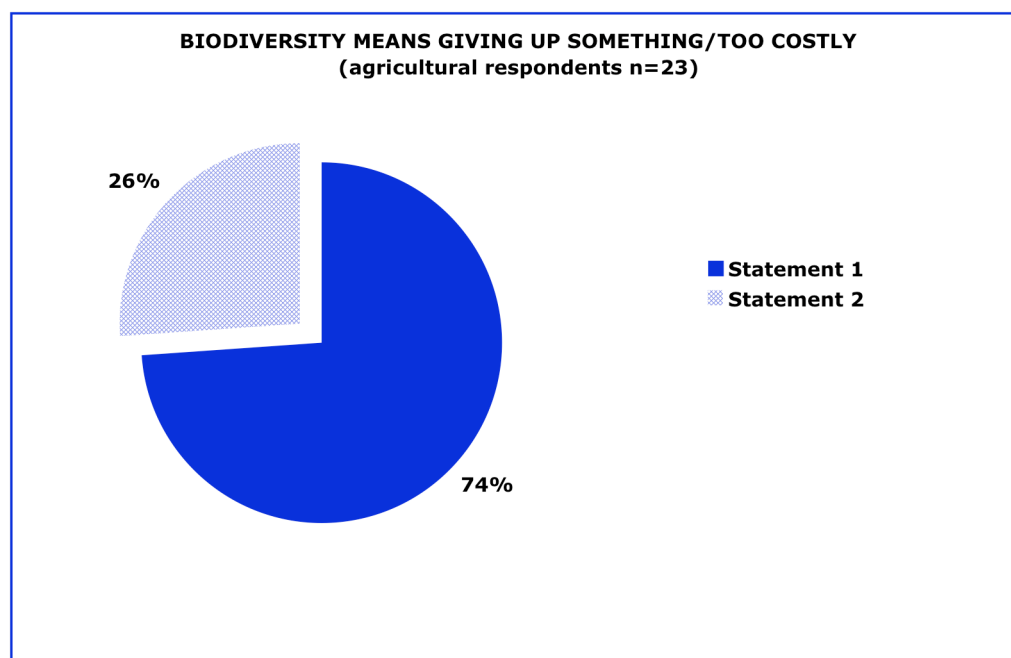


Figure 11

*Respondent Comments*First Preference for Wording (Statement 1 = 74%)

- Add at the end: "increasing litter carryover in native pasture land".
- Greatly reducing use of phosphates in fertilizers.
- I am not 100% sure that it covers the benefits clearly enough.
- Is it possible to combine both statements in one paragraph? That would apply to all producers better.
- More inclusive.
- Suggest amend preferred statement to show better link to producer benefits and biodiversity. For example, using off-site waterers and moving salt away from waterbodies to improve riparian plant production and water quality. The second statement is another example that could be included in the preferred statement.

Second Preference for Wording (Statement 2 = 26%)

- "Forage".
- Too limiting. Agriculture is farmland also, and most places are mixed grain and cattle. I like to specifically *[sic]* for cattle, but cropping too close to water, application of chemicals too close to water, or runoff to water, also very important.

3.3.2 Personal Actions Impact Biodiversity

Survey Question Many people agree that they play a big role in the health of the environment, but when asked about their personal impacts on the landscape, they often say they don't have a major impact themselves, regardless of where they live or what they do. This notion can be summarized as "My actions don't impact biodiversity... it's those other people and their activities". Which of the following statements best explains that personal actions are important to, and do impact, biodiversity?

Statement # (reported order of preference)	TABLE 26	Random Order Used on Survey
1	Everyone's actions can impact landscape integrity and biological diversity -- whether it's the demand for oil and gas development you create by driving your car or truck, buying a new home where native habitat was cleared, or contributing to the need for more landfill space with your kitchen garbage.	1
2	Just as you can have a cumulative negative impact on biodiversity and landscape health, your actions can combine with others to positively impact landscape health, such as choosing to buy foods that support and encourage farmers to use sustainable practices, disposing of oil or used batteries safely to help protect water quality and fish habitat, or using fertilizers and herbicides only when needed and at recommended rates.	2

Tabular Results

The most highly ranked message wording (referred to here as Statement 1), was chosen by just over one-half (56%) of respondents. The second wording option (Statement 2) was chosen by 44% of respondents. See Figure 12.

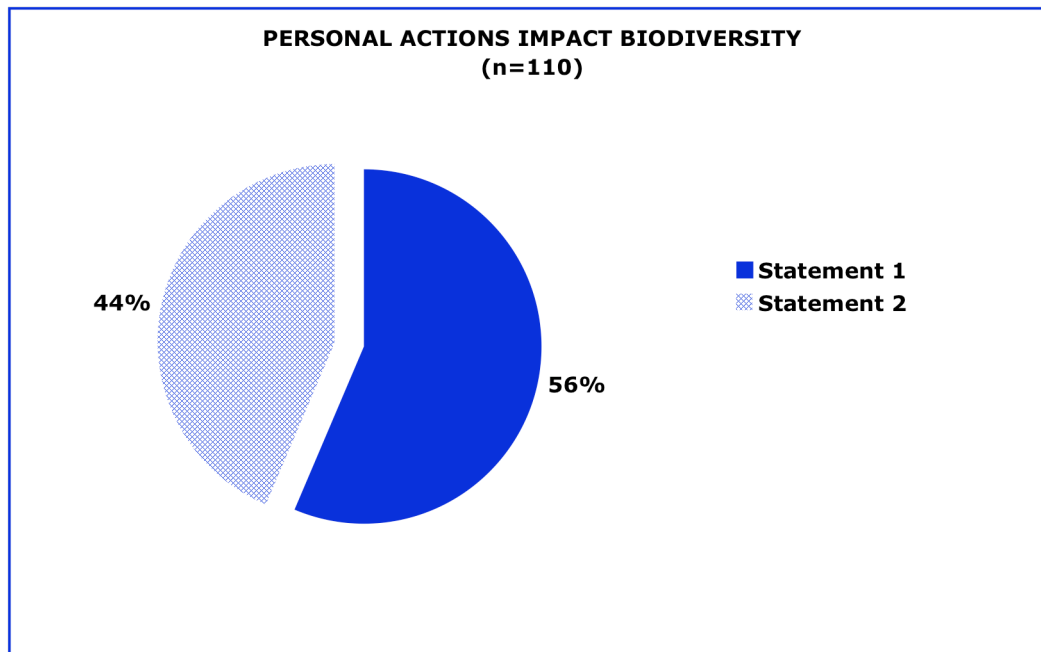


Figure 12

Respondent Comments

First Preference for Wording (Statement 1 = 56%)

- Although it is generally better to emphasize the positive, this option just reads better!
- Both are good - one just focuses on negative and the other positive. I think both should be used.
- Both comments are good. I chose the first just because it explains the "how", but I like that the second gives options on how to reduce one's impacts.
- Delete the word "can" from option 1. Option 2 does NOT talk about actions that impact positively on biodiversity, they just minimize or mitigate negative effects.
- Delete the word integrity in first sentence.
- Do you realize the second choice has 67 words in the sentence? And a lot of them are large.
- Hmm, this was tough - #2 is nice, but #1 really makes you think about things we take for granted.
- However, I like both. I think that it is important to show the negative and positive impacts we have on the environment.
- I don't really like the second option because it seems to point a finger at and farmers/producers.

- I like the approach of the selected one, but range of examples in the other one.
- I like them both. Maybe a preference for the first because it's more direct.
- I think it is more of a case that people do not see, or do not want to see their personal impacts, and it is much easier to blame others.
- It's hard to get people to make this connection - as with climate change, the problem seems overwhelming - perhaps we can focus on concrete actions people can take that would make the most impact on biodiversity?
- More relevant to current population in Alberta.
- Positive message important too, but this needs to get across first.
- Should add in something positive like "Fortunately, there are many small actions you can take to alleviate your impact such as carpooling, purchasing recycled products or composting."
- The first statement could be followed by the latter part of the second to give a positive spin on what people can do to reduce their impact once you've convinced them that they do have an impact.
- The second one says "positively impact landscape health" which sounds like you are emphasizing the words "negative impact". You mean "impact landscape in a positive way". I think you should try to combine the left side with the last half of the right side.
- The second option is not as easy to read and understand. More people will understand option one.
- Why not a more positive statement? What can an individual do to protect and promote biodiversity?

Second Preference for Wording (Statement 2 = 44%)

- Better explanation.
- Both statements work, I prefer the second one because it talks about positive impacts as well as negative impacts.
- Get rid of "choosing to buy foods that encourage farmers to use sustainable practices". What is sustainable? Might replace with buy locally grown foods.
- I didn't find that either statement best explains that personal actions are important. The first being too drastic, the second is better but I'm uncomfortable with "cumulative" and also how would a consumer buy foods that support farmers to use sustainable practices (food is not labeled, branded as such at the supermarket).
- I found it hard to choose on this one, as both messages are important. I think getting across the idea that all of our actions have an environmental impact is an important first step of awareness. Creating the realization that those impacts could easily be positive too is important, but I think people need to understand Newton's environmental law first ("every action has an environmental impact - it's just a matter of degree of impact").
- I think it's important to put the onus on the individual. I like how the other statement really puts the individual's impact into perspective (with the oil and gas development and landfill space), however, I feel that a positive approach is also needed in order to keep people "on board," and making positive changes.
- I think the positive approach is more effective.
- Need to integrate the two statements succinctly.
- People identify better with "positive" messages.

- Really a combination of the two. Destroying habitat to build cottages or subdivisions, or covering quality farmland with industry development (for example, Heartland) is a huge factor.
- Second statement is constructive and positive. Admonishing without solutions is not helpful.
- The first is more hard-hitting, negative but more concise, requiring less explanation. However, I'd probably go for the second but perhaps it would depend on the audience and the urgency. I would also explain/remove the "cumulative" using instead the example of neighbours all contributing positively in the actions you mention.
- The first statement requires an understanding and knowledge of regional issues. If one is not aware of the process and impacts involved in producing oil and gas or one does not know the history of the landscape where they buy a home, this statement will not raise their consciousness. The second statement speaks of local actions and solutions. Once one is able to achieve these actions they can then more easily look into regional issues of the decision they make.
- The first would be more applicable to an urban audience.
- The statement that starts out "just as you..." is more positive and offers solutions right in the statement and therefore will be heard more easily, however I do think people need to realize that our lifestyle choices have an impact even if it hurts to hear it.
- This is the more positive statement.
- This was a tough choice. I like the positive spin on the second option but the opening statement of the first. I think you should change "can" to "do" though. Everyone has an impact, it's just the extent and intensity that vary.

Not Classified

- I like some combination of the two - the simplicity of the first combined with the positive reinforcement of the second in terms of "your choice" makes a difference.
- I really don't like either one, a lot. Every one will drive a car or truck. No one cares what was on the land when they buy their dream home. 2. Choose to buy foods that support and encourage farmers to use sustainable methods? How on earth are you as a shopper for your food going to know where your corn flakes came from? Be a bit more practical. 5th graders in schools have excellent criteria on this one.
- Take the first part of the left statement and the second part of the right one and you'll have a good statement.

3.3.3 Importance of Biodiversity to the Individual

Survey Question We sometimes hear “Biodiversity isn't important to me -- I don't get any value from biodiversity”. This may be one reason why some people do not take actions that support biodiversity. Which of the following statements does the best job at explaining that biodiversity is important to us as individuals?

Statement # (reported order of preference)	TABLE 27	Random Order Used on Survey
1	Biodiversity is important to everyone. When we protect native species and habitats, we are also improving water, soil and air quality, reducing erosion, and increasing landscape health that we rely upon for food, water and livelihoods.	3
2	Diverse plant and animal life contributes to the lives of all of us, even if we don't bird-watch, hunt, or fish, or even care about them -- we all eat food, require medicines, and need water to drink -- these are all things that a healthy landscape produces.	2
3	If you think biological diversity isn't important to you, think again. From 25% to 50% of prescription medications come from the rich natural world of plants, and we all rely upon insects to pollinate our crops so we have food to eat.	1

Tabular Results

The most highly ranked message wording option (referred to here as Statement 1), was chosen by less than one-half (43%) of respondents. The second preferred wording option (Statement 2) was chosen by just over one-third (39%) of respondents, while the third option (Statement 3) was chosen by 18% of respondents. See Figure 13.

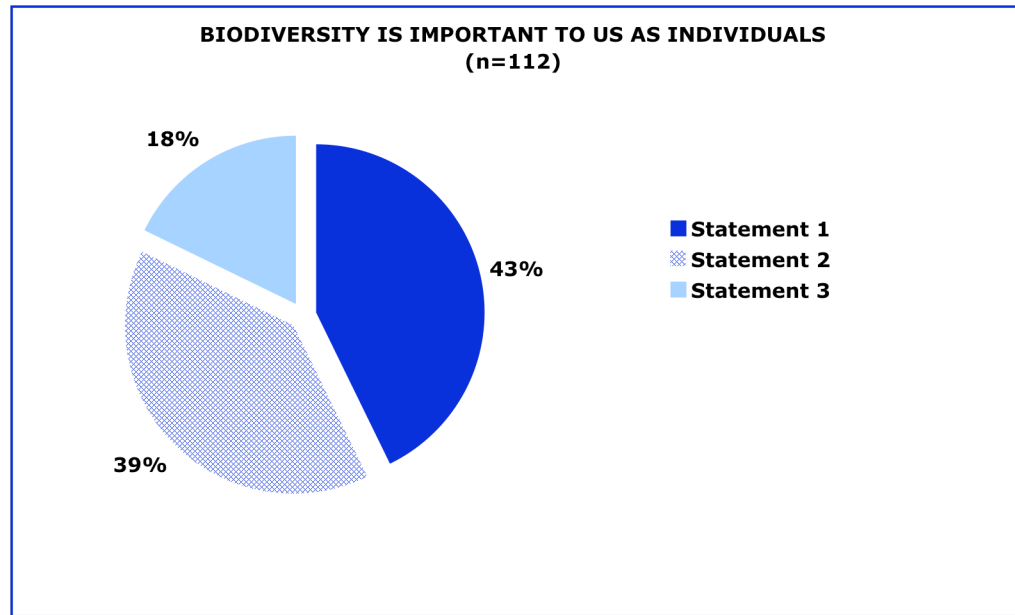


Figure 13

Respondent Comments

First Preference for Wording (Statement 1 = 43%)

- 2nd statement is just as good but I couldn't put a check on both.
- Another reason why people might think that biodiversity is not important to them is if they do not understand the meaning of the expression. Thus statement 1 would be the least useful in this context. Another element that might help people understand the value of biodiversity is to make a more direct link that a healthy economy depends on healthy landscape or ecosystems.
- Can you integrate a little of the first statement, i.e. the medicinal plants part, into the statement?
- First one would be a good second choice.
- I am not sure that most people would accept this as a reason for maintaining biodiversity.
- I like the idea of medicines, if it could be added to the last one somehow it would even be better.
- I like this one because of its focus on ecosystem function.
- Less specific, speaks to broader audience.
- More encompassing statement.
- Quite frankly, I've never heard the statement "Biodiversity isn't important to me...". Anyone who knows the meaning of the word probably agrees with the statement. The key thing is whether they do anything about it. It's like saying "Pollution isn't important to me... or... Murder isn't important to me." (They don't see these "things" as impacting them.) The key is that if you don't allow your actions to be self-reflective in terms of your impacts, you just don't care about the

subject matter. That's where most people are at in my mind. Humans are in their "worst" simplification... self-serving, seekers of comfort, high quality of life enthusiasts, scratching out an existence in a "dog-eat-dog" world. What, me worry?

- That one hit the mark very well.
- We would have a very dull existence with a diverse and vibrant environment. That very diversity is not only good for bird watching, but for sustaining our very lives. Food production, medicines, clean water, building materials, etc., all rely on a healthy environment comprised of biological diversity in a variety of ecosystems.

Second Preference for Wording (Statement 2 = 39%)

- "That healthy landscapes".
- Could follow with %s which are pretty punchy.
- I think all 3 options convey a valid message. The second one provides the best personal connection or hook though. It left me wanting to find out how, which is a good way to create awareness. The first one has been used too much and doesn't have the same connection now. The third one is missing the hook and is too technical a presentation to draw people in.
- I think the first one is effective by negative.
- I think this gets the point across without getting too technical. I would take out the words "or even care about them." My second choice would be option 3 but I think the first statement would need to be altered so it is clear that you are saying that biodiversity is an important contributor to everyone's well-being, not that everyone feels it is important.
- It would be great to get some specific Alberta examples that tie back to the Average Joe.
- Probably a combination of options 1 and 2 would be better: "rich natural world" + "wide variety of beneficial insects, bacteria, etc." + "make it possible to produce medicines, food, clean water, etc.".
- The first choice is very smarmy - the kind of thing your Grade 6 teacher would say. The last choice erroneously states that these things "increasing landscape health". They more likely maintain such health.

Third Preference for Wording (Statement 3 = 18%)

- Medications - hit 'em where it hurts!
- Perhaps start out with the line the third choice to soften it up a bit (it seems a bit harsh). "BioD is important to everyone". I like the "facts-ma-am" attitude here.
- This statement most specifically explains the importance of biodiversity in everyday life.
- Tough one! I think the example in the first one is more concrete and sticks in the mind more, hence that choice, but the second one could be good to "Having a variety of life on the landscape contributes to...", except it repeats 'life/lives'.

Not Classified

- How about "Biodiversity impacts every person in many ways. Biodiversity cleans our water and our air, feeds the livestock that we eat, pollinates the plants we eat and produces chemicals used in our medicines. Biodiversity also supports industries like agriculture, forestry, commercial fishing and tourism, which form the backbone of our economy.

3.3.4 Taking Action on Own Land to Support Biodiversity

Survey Question 100% of those recently surveyed said that, as an individual, they play an important role in the health of both their watershed AND their local landscape. However, not everyone stated they take action or feel responsible for watershed health when making management decisions about their own places. Please select the statement that is strongest in terms of motivating individuals to take action on their own places that supports biodiversity.

Statement # (reported order of preference)	TABLE 28	Random Order Used on Survey
1	Your actions make a difference to biological diversity! Each small way that you improve the health of the landscape, including reducing pollution and waste or increasing habitat, means there is that much more opportunity for native plants and animals to thrive.	2
2	Because all individuals, urban and rural, play an important role in the health of our landscapes, your actions add up! Each action you take is a small piece of a large, cumulative puzzle. Each piece of the ecosystem that you take away or impact creates a hole or a gap, leaving a non-functioning landscape. Each piece of the puzzle that you support helps the puzzle show the image it is supposed to, to allow each interwoven ecosystem to function.	1

Tabular Results

The most highly ranked message wording option (referred to here as Statement 1) was chosen by two-third (66%) of respondents. The second wording option (Statement 2) was chosen by one-third (34%) of respondents. See Figure 14.

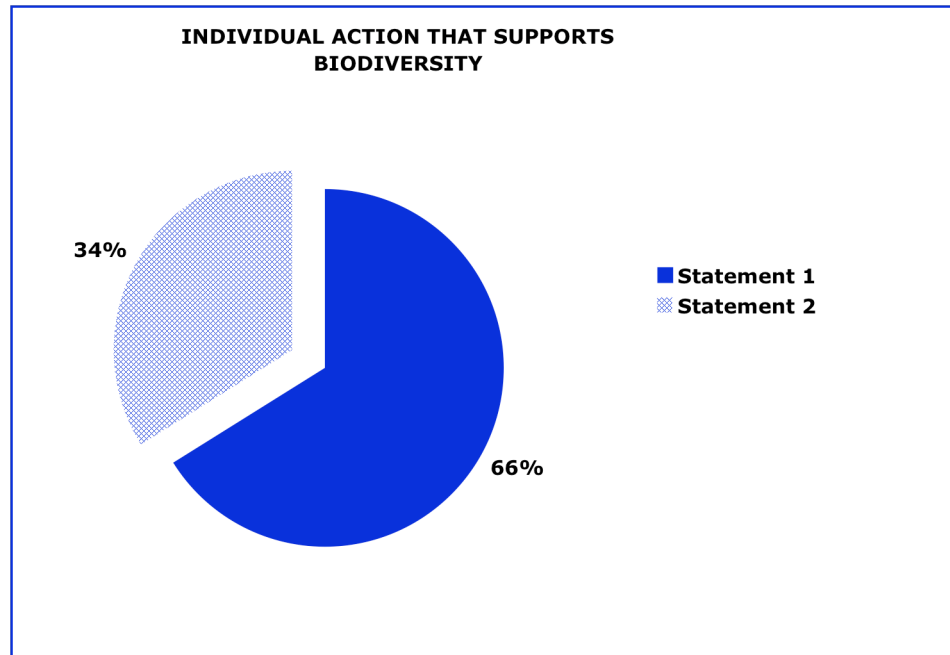


Figure 14

*Respondent Comments*First Preference for Wording (Statement 1 = 66%)

- Again the option I chose is short, to the point and positive.
- Another tough decision. Again, I went for the more concise statement; however, I liked the imagery with the other option.
- Could you incorporate a bit from the first option after the first sentence? Each action you take is a small piece of a large, cumulative puzzle. Each piece of the puzzle you support helps the puzzle show the image of a healthy landscape, to allow each interwoven ecosystem to function.
- Expand on number two.
- First choice is too complicated.
- I think it would be even better to give a few more smaller suggestions in the statement such as encouraging recycling.
- If cumulative effect could be included in the last one it would be even better.
- Include the human element, for example, when we have biological diversity, plants, animals and humans thrive.
- Maybe show an example of successful actions that a community took and what the benefit was? For example, Plainsville increased biodiversity by creating a healthy riparian zone along its creek - which improved the water quality of their creek and brought back many birds and animals.
- More positive - always try to present things in a positive way. People do not respond to negativity.
- Simpler and has power words "make a difference" "Each small way that you improve..." "opportunity... to thrive".

- Simpler is better.
- Statement 1 is too negative when saying that each negative action creates holes and gaps.
- Written materials (surveys, brochures, etc.) are shown to have negligible effect on people's behaviour. See www.cbsm.com for further discussion - or, to search the "Fostering Sustainable Behavior" Listserv online archives, go to <http://www.cbsm.com/forums>

Second Preference for Wording (Statement 2 = 34%)

- Again, visual examples (puzzle pieces), I like it.
- I like them both.
- I really like the puzzle analogy (I can picture the graphics to support it), however the wording of the statement is a little confusing, mainly the last sentence.
- I would take out the word "cumulative", i.e. a large puzzle or change to "additive".
- Like the analogy.
- More poetic. Need to develop personal responsibility (who cares what the neighbours think, this is right).
- Start with "Your actions add up!" Then "All individuals, urban ... landscapes."
- This option could be tidied up a little. It also depends on who the target audience is.

Not Classified

- I don't feel that either one really hit the mark. How about... "Every action counts. It can contribute to the problem, or the solution, but each one does make a difference. Cumulative impacts have recently been recognized as significant as far as environmental damage is concerned. However, cumulative impacts can also be positive. They can restore habitat, biodiversity and environmental health. Make your actions positive ones that contribute toward a better future."

3.3.5 Taking Action on Own Land for Watershed / Environmental Health

Survey Question In thinking about the relationship between watershed health and the health of the environment on an individual's own place, please rank the following four statements for their ability to encourage individuals to be personally involved or to take action for a healthy environment.

The ranked order of preference for the four message options is illustrated in Table 29.

Statement # (reported ranking)	TABLE 29	Random Order Used on Survey
1	Healthy landscapes = healthy people. <i>(n=104, selected as first by 34% within this option)</i>	4
2	Healthy watersheds = healthy people. <i>(n=106, selected as second by 40% within this option)</i>	1
3	Landscape health relies on you! <i>(n=104, selected as third by 39% within this option)</i>	2
4	Landscape health relies on your actions! <i>(n=106, selected as fourth by 36% within this option)</i>	3

Respondent Comments

The following comments cannot be categorized according to the ranked choices made by the respondents, each having made four selections within the same question, and so the comments are provided in alphabetical order.

- "Like Smokey Bear said - Only you can prevent forest fires". It was effective and maybe too effective. A forest fire now and then is good for the ecosystem.
- Combine one and two.
- Healthy land = Healthy people. Or it could change a little bit depending on the project. It could be Healthy ranch = healthy people or healthy city = healthy people but would have a similar look.
- Healthy watersheds = healthy communities... I really don't like any of the options above very much.
- Hit people where it counts, themselves. Increases the impact to where hopefully they begin making positive choices.
- I am assuming that watersheds contain landscapes... perhaps consider using both terms.
- I don't like any of them.
- I don't like any of them. They all make huge leaps and don't link.
- If we adopt a slogan along these lines, we need to be specific in the actions people can do to contribute... these are general and don't speak to what people can do specifically to contribute.
- I'm not sure if self-interest is the best motivator, but suspect it probably is!
- Indicate that action is needed, not just a comment. For every action, there is a reaction.
- Maybe one statement that speaks to the inclusion of watersheds being included in the definition of "landscape" could simplify.
- None of them are particularly catalyzing (see comment above).
- Not sure you can place any one component of the environment ahead of another. We rely on land, water and air. How about... "Healthy environment = healthy, happy and prosperous people." Since our lives seem to be driven by

- money, I've included prosperity.
- Sorry - none of the above...but I don't have a simple slogan in mind.
 - That one should be a bumpersticker!
 - Why not "People make healthy environments which make healthy people."
Longer yes, but truer to the intent and showing a cyclic aspect to progress in this area. I don't like any of the relationships posed as communication tools.
 - Would have to explain watersheds, people might understand landscapes better at a glance?

3.3.6 Motivating Farmers and Ranchers to Take Action that Supports Biodiversity

Survey Question In a recent Cows and Fish survey, 88% indicated that potential negative impacts on water quality/quantity affected their management decisions in a big way. Please rank each of the following two statements in terms of its ability to motivate farmers and ranchers to take action that supports biodiversity.

Statement # (reported ranking)	TABLE 30	Random Order Used on Survey
1	In our recent survey, almost 90% of farmers and ranchers reported that they consider impacts to water quality/quantity when making their management decisions, which benefits fish, amphibians and aquatic life that depend on clean and reliable water for a healthy aquatic ecosystem in which to survive. Are you part of this 90%?	1
2	Did you know that maintaining stubble through reduced tillage not only saves on fuel, and traps carbon and moisture, but that it also improves wildlife habitat and reduces erosion?	2

Tabular Results

The most preferred message wording, i.e. ranked as first of two options and referred to here as Statement 1, was chosen by just under three-quarters (71%) of respondents who described themselves as farmers or ranchers. The next most preferred wording option (Statement 2) was chosen by approximately one-third (37%) of these respondents. See Figure 15.

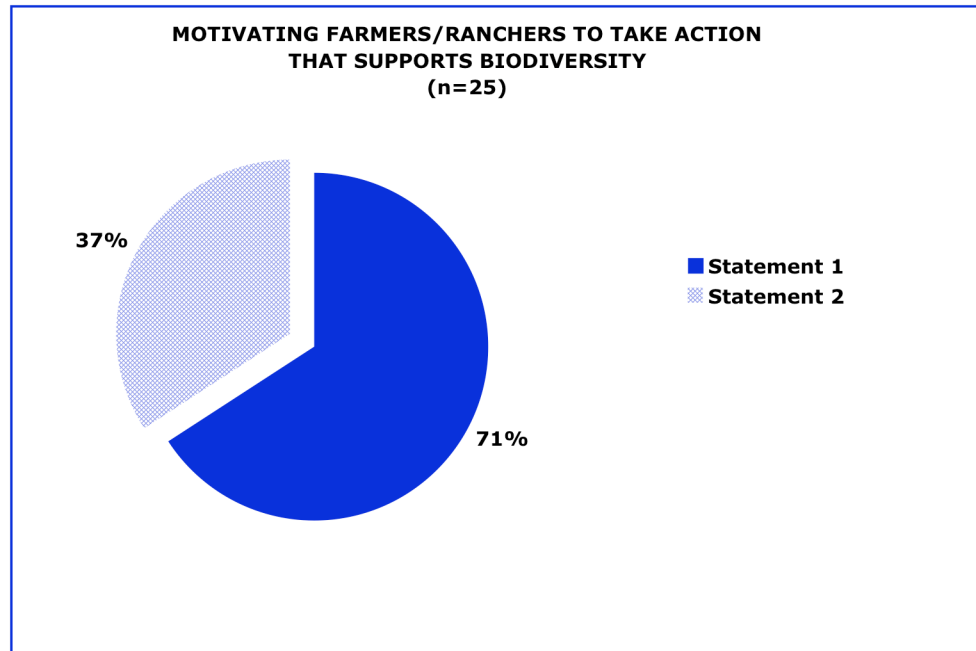


Figure 15

*Respondent Comments*First Preference for Wording (Statement 1 = 71%)

- Reduces erosion seems like an afterthought and maybe isn't needed for this statement...
- Tillage is not relevant to me.
- Both good but so different that they really need to both be used.
- Many producers do not do any tillage and those that do already know the benefits.

Second Preference for Wording (Statement 2 = 37%)

- The response has to have a benefit to the landowner in real terms.

3.3.7 Motivating Livestock Producers to Take Action that Supports Biodiversity

Survey Question Answer this question only if you are a livestock producer or owner. Otherwise, please skip ahead to the next question. Please select the statement that is strongest in terms of its ability to motivate a livestock producer to take actions on their own place that support biodiversity.

Statement # (reported order of preference)	TABLE 31	Random Order Used on Survey
1	Did you know that up to 75% of livestock producers in Alberta se off-site watering systems? Not only does this provide cleaner water to their livestock, improving herd health, but it benefits streambank and shoreline habitat for fish and wildlife, too?	2
2	Did you know that using off-site watering systems improves water quality and cattle weight gains for you and downstream neighbours, but it can also benefit fish and wildlife that require streamside and shoreline habitats?	1
3	Using off-site watering systems improves water quality for livestock and neighbouring users, and also improves habitat for fish and wildlife alongside the waterbody.	3

Tabular Results

The most preferred message wording option (referred to here as Statement 1), was chosen by one-half (50%) of agricultural respondents who categorized themselves as livestock producers. Statement 2 was chosen by about one-third (35%) of livestock producer respondents, with the balance (15%) choosing the third wording option (Statement 3). See Figure 16.

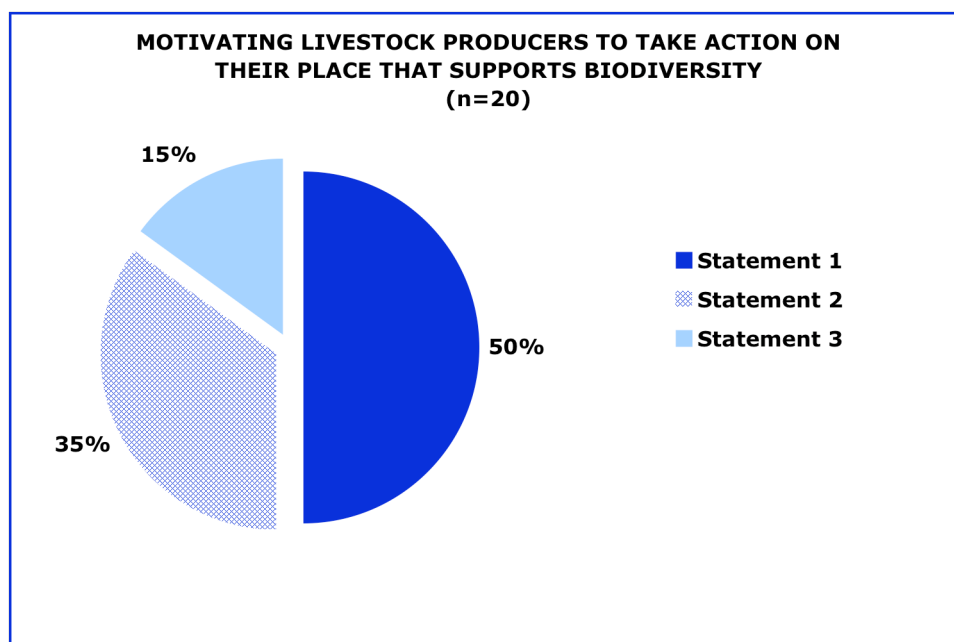


Figure 16

*Respondent Comments*First Preference for Wording (Statement 1 = 50%)

- 75% seems like a lot... but if true, I like the wording of this one.

Second Preference for Wording (Statement 2 = 35%)

- Cattle weight gains are important to bottom line thinkers. Telling them 75% already do something is a bit of a stretch I am sure!
- I doubt the 75% figure. Certainly not in my area.
- In my experience with the older producer generation is they sometimes need to know how they gain by changing. The coming generation may not need that as much so option 3 might be just as useful.

Third Preference for Wording (Statement 3 = 15%)

- No comments.

3.3.8 Motivating Livestock Producers to Protect Moisture in Riparian Plants

Survey Question This question is only for those who are a livestock producer or owner. If you don't have livestock, please skip ahead to the next question. Riparian areas - those streambanks, floodplains and shore areas next to waterbodies - make up a very small part of the landscape, but they are often very important for forage production in pasture because of the abundant moisture available to plants. However, riparian areas can be particularly susceptible to trampling damage. Please select the statement that is most likely to motivate a livestock producer/owner to take action related to riparian grazing in order to meet this need.

Statement # (reported order of preference)	TABLE 32	Random Order Used on Survey
1	Graze riparian areas next to streams, lakes and wetlands with care -- avoid them when soils are wet and soft to minimize hoof impact.	3
2	Careful timing of grazing in riparian pastures is needed because these areas are vulnerable to trampling when soils are moist.	1
3	Because streambanks and shorelines can be trampled when soils are soft and moist, graze these areas to avoid these vulnerable periods.	2

Tabular Results

The most preferred message wording option (referred to here as Statement 1), was chosen by just over two-thirds (68%) of agricultural respondents who categorized themselves as livestock producers. The next most preferred wording option (Statement 2) was chosen by about one-quarter (26%) of livestock respondents, with the balance (5%) choosing the third wording option (Statement 3). See Figure 17.

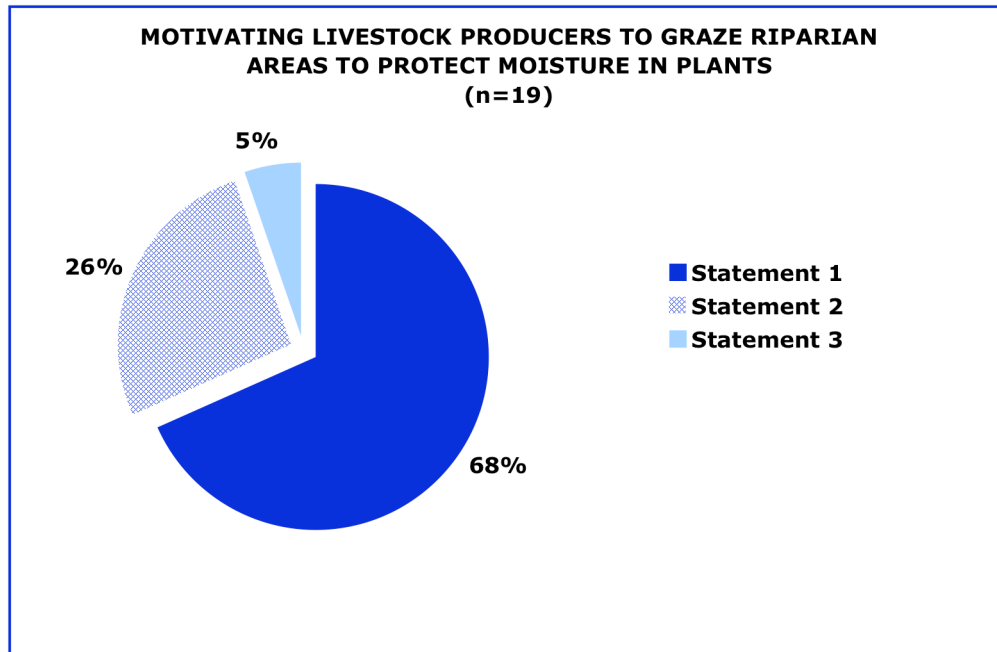


Figure 17

Respondent Comments

First Preference for Wording (Statement 1 = 68%)

- Fairly equal statements.

Second Preference for Wording (Statement 2 = 26%)

- Change "vulnerable" to something like "easily damaged/destroyed".

Third Preference for Wording (Statement 3 = 5%)

- No comments.

Not Classified

- Neither one would give me a reason to change my grazing strategy. If you avoid the shoreline year after year for grazing, you probably deplete the native grasses by hitting them the same time every year. Think about what else you may be impacting when you make a statement.

3.4 OTHER IDEAS FOR COMMUNICATING ABOUT BIODIVERSITY

Respondents were given the opportunity to provide additional suggestions to guide Cows and Fish in communicating effectively about biodiversity (see below for verbatim comments). The key themes demonstrated by these comments tend to reinforce the approach to program content currently used by Cows and Fish.

- **Simplicity.** Keep language clear, simple, precise and personalized. Build from basic concepts like “numbers” and then build to more complex ideas such as “resiliency”.
- **Connectivity.** Communities and individuals are part of ecosystems as much as plants and animals. Use both basic/foundational definitions as well as the existing, more subtle analogies to relate these ideas.
- **Barriers and Costs.** Attempt to address or adopt techniques that break down barriers to action, for example through community-based social marketing techniques). Include messaging about the actual costs involved in having and preserving biodiversity.
- **Audiences.** Target message type/content to various audiences, which differ, for example between urban/rural groups and older/younger groups, and take advantage of school settings.
- **Keep up the good work!**

Verbatim comments on this question are provided below.

Respondent Comments

- Although you mention here and there the web of organisms or talk about the need to maintain their interactions, and talk about watershed and landscape, it is still a very subtle message in the statements above. Moreover none of the statements seem to have this openly as a main message. It might be good in your documentation to have at least in one place the clear, rather than subtle, message that maintaining a diversity of species is not sufficient, what needs to be maintained is the species and their interactions and/or the ecological processes that allow the species to survive in the landscape.
- Always remember your audience. The simpler the language, the more accessible it is to a greater number of people.
- Biodiversity IS about numbers in its most simplistic interpretation. Diversity inherently suggests numbers and/or variety. When we start equating a lot of



other associated ideas like... health... resiliency... etc. there is the fear of losing track of what we are really talking about and making the concept more a slogan. It's like the word "environmentalist" which means so much to so many people... all the way from a hated tree hugger to a political lobby group to who knows what... it eventually becomes quite vague. I think the meaning of biodiversity has to remain clear and simple. Don't try to equate it to everything good that has to do with the environment. It is just an important and somewhat measurable factor.

- Depending on the audience, the concept of an ecological footprint, with accompanying picture might be useful.
- Good luck and good work!!!
- Good survey. Very important to present the right messaging and I think this is a good way to test the waters. Keep up the good work!
- I found it difficult to choose between some of the options presented. Some of them did not give a clear presentation of the facts. For example, Healthy watersheds = healthy people is a fallacy. A person who smokes, as many do in rural Alberta, wouldn't be healthy no matter how healthy the watershed. I didn't answer one question because neither option was acceptable. I suggest taking a really good look at the message and what intent you want.
- I hope you work with both urban and rural municipalities. Have you thought of contacting the faculties of education in the universities and colleges of Alberta? Those grads will influence thousands of lives in their teaching careers.
- I remember the first time someone mentioned the Cows & Fish program to me. Name immediately caught my curiosity and made me want to more. What could the possible relationship be between cows and fish? Use that curiosity factor in your messaging. Make people want to know more.
- I think I made the point that many of your words and concepts could be made much simpler and easier to digest. We shouldn't use the arcane language of professionals and bureaucrats when we are sending a message to a broad audience. This is not to mean we talk down to them but "Plain English" is not a bad thing.
- I think it is important to include in your messages to communities and individuals that they the people are also part of the ecosystem (not separate). When plants suffer so do humans, when humans suffer so do animals, when animals suffer so do humans, etc. We need to deeply feel the connectivity with biodiversity to put the talk into the walk at various levels and scales and time and space.
- I think that it is important to emphasize native species when talking about biodiversity. Introducing brown rats would increase biodiversity; so would planting Kentucky bluegrass in a healthy fescue grassland (at least temporarily). How far should the stress be on self-interest? We should protect biodiversity because it is good for us (clean water, etc). Is there any place for protecting wildlife or landscapes for their own sakes, not just for the benefits they provide us? Maybe this is a bit optimistic! It is much easier (cheaper) to protect existing biodiversity than it is to restore it when it has been lost. By protecting it, we are leaving future generations more options.
- I think that you need to address the value and cost of having and preserving a healthy ecosystem. There should be heavy cost added to any proposal that disturbs or destroys habitat. Not every fool who thinks he needs a lake property or needs to go pounding through a mud bog should have the right to destroy.

We (the govt - ha ha) need heavy penalties/cost for our negative activities. If you want to pave paradise and put up a parking lot, then the cost should be prohibitive.

- I think this is a very important message to keep the health of our streams.
- I think you guys are doing a wonderful job! If you would like any more input feel free to contact me.
- I would strongly recommend using the tools of community-based social marketing. www.cbsm.com www.toolsofchange.com Framing is especially important when coming up with messages. I'd like to help any way I can.
- If it was economical to mail all your pamphlets to each stakeholder, it would be the best way to get the message across. Re-enforce, re-enforce, keep in their face. However, that is an impossibility so I really don't have any worthwhile suggestions. Cows and Fish are doing a great job but I have not answers as to how you can reach ALL the people ALL OF THE TIME. It might be worthwhile to see how much it costs to place minitorials or ads on TV and/or the farm show at noon on CFCW. I think the little digital programs you are working on is a very good initiative and has huge potential to get the word out there. I'm afraid I do not have the answer as to what path to take other than meetings, and how do you get the people to attend the meetings? They are afraid they are going to get their hands slapped or fingers pointed because they are not working toward maintaining biodiversity.
- I'm so glad you're doing this!
- Interesting survey - seems like we're all grappling with this!
- It may help to use examples that people can relate to and associate these to images you have on file, but I am sure this is part of your plans.
- It would be interesting to do a random survey of urban and rural residents about what they think about biodiversity and how they might link it to their everyday lives...
- Keep it simple. Focus on functionality. Express in a personal way.
- Keep up the good work. Teaching this is a challenge but we will all keep trying.
- Messages need to be positive and educational, not finger pointing.
- No, I think you are going along the correct path. I have never seen an interactive prescreening of information for public consumption.
- Presentations like the one Lorne Fitch gives on biodiversity should be given at schools, colleges, and universities as well as to youth groups (hunting clubs, boy scouts, girl guides and 4-H). I believe by informing the youth you will have the most impact on society.
- Pretty good - only thing I suggest considering is that it seems to me in some of the statements there is confusion about biodiversity and environmental impacts - could cloud messages.
- Research shows that people's stated values and beliefs often do not translate into personal actions. Understanding the barriers as to why people do not want to change their behaviours may help craft educational messages. Healthy environments are better for human health, and also provide economic and social benefits.
- Some of the statements were a little lengthy/wordy, which made me lose focus in reading them. I've already included the rest of my comments previously.
- Suggest brevity and avoidance of ecological jargon should be the rule throughout.

- Suggest you also look at Introductory Guide to Valuing Ecosystem Services (<http://www.defra.gov.uk/wildlife-countryside/natres/eco-value.htm> and <http://statistics.defra.gov.uk/esg/evri/evri/Benefits%20transfer%20and%20EVRI.htm>)
- Thanks for the survey and the great Cows and Fish program. Getting something like this into the school system to teach children, who would then influence their parents, is desirable.
- This survey tells me you are trying to tailor your message specifically to achieve specific ends. My only additional comment is to say that I think the message will need to be tailored differently for urban and for rural populations. These groups have very different concerns, and different (but still very important) impacts on the environment. Thank you for your great work!
- When you write your next booklet about this issue, use fewer of those diagrams with arrows all over, and fewer pictures crammed in on a page, because sometimes I look at the pages and if it looks like too much work to think it through, I lose interest.
- You are in a bit of a tough space because there is a lot of inter-generational transfer going on with landowners right now. What generation to you target? Are they close enough that you can target both in the same way? I don't have the answer but its something to consider. Good Luck!
- You may want to consider using concrete examples of how biodiversity "looks" in the environment and how far-reaching the web reaches. For a very simple example, a drought and or sedimentation due to erosion may negatively affect insect hatches in area waterbodies, which could potentially affect tree swallows and other birds which eat the flies. The health of these tree swallows and their nestlings may be compromised. This is important not only locally, but internationally, as tree swallows migrate as far as Mexico and Central America.

4. EFFECTIVENESS OF SELECTED AWARENESS TOOLS

A series of print materials were made available at the workshops for participants to comment on in terms of content, format and impact on developing awareness and influencing management choices. The materials included:

- one booklet, entitled Riparian Areas: A User's Guide to Health; and
- five fact sheets:
 - *Lakes and Wetlands*;
 - *People and Riparian Biodiversity*;
 - *Water Quality and Riparian Areas*; and
 - two Producer Stories including:
 - *Glen & Kelly Hall* (reviewed at the Millarville workshop only); and
 - *Tongue Creek Ranch* (reviewed at the Sandy Beach and Rockyford workshops).

4.1 EFFECTIVENESS RATINGS

As part of the discussion about the effectiveness of the selected suite of Cows and Fish print materials, workshop participants were asked to specify a rating for each document using a three-point scale ranging from very effective to not effective. Results are shown in Table 33.

TABLE 33 RATING OF PRINT MATERIALS				
	VERY EFFECTIVE % / #	SOMEWHAT EFFECTIVE % / #	NOT EFFECTIVE % / #	DON'T KNOW/ NOT SURE % / #
<i>Lakes and Wetlands</i> (n=24)	33 / 8	54 / 13	13 / 3	0 / 0
<i>People and Riparian Biodiversity</i> (n=18)	28 / 5	50 / 9	22 / 4	0 / 0
<i>Water Quality and Riparian Areas</i> (n=23)	56 / 13	35 / 8	9 / 2	0 / 0
<i>Producer Stories: Glen & Kelly Hall</i> (n=9)	22 / 2	78 / 7	0 / 0	0 / 0
<i>Producer Stories: Tongue Creek Ranch</i> (n=16)	56 / 9	38 / 6	6 / 1	0 / 0
<i>Riparian Areas: A User's Guide to Health</i> (n=25)	72 / 18	28 / 7	0 / 0	0 / 0

All awareness tools reviewed were rated as effective by a majority of workshop participants in each case (whether Very or Somewhat Effective). However, and remembering that there was just a small number of participants involved, some distinctions were made about the degree of effectiveness, as follows.

- Only the User's Guide received a solid majority rating of Very Effective, selected by about three-quarters of respondents (72%).
- A slight majority (56% in each case) gave a Very Effective rating to *Water Quality and Riparian Areas* and to *Tongue Creek Ranch*, with about one-third of participants also rating these Fact Sheets as Somewhat Effective.
- *Lakes and Wetlands*, and *People and Riparian Areas*, were rated by about half of participants (54% and 50% respectively) as being Somewhat Effective.
- *Glen & Kelly Hall* received the lowest overall rating (relatively speaking), with over three-quarters (78%) identifying that Fact Sheet as Somewhat Effective, and less than one-quarter (22%) assigning it a rating of Very Effective.
- *People and Riparian Areas* received the greatest proportion of ratings of Not Effective, with just under one-quarter (22%) rating it as Not Effective.

Refer to the following sections for explanatory feedback about the print materials.

4.2 **FACT SHEETS**

4.2.1 **Feedback on the Suite of Five Documents**

General observations about the Fact Sheets are set out below and are followed by tool-specific comments where available, as well as opportunities for improvement.

Content/Format

- "Very professional."
- Easy to read; easy to understand; uses "layperson's language"; nice to look at.
- Very informative.
- "Reader-friendly."
- Pictures clear and easy to understand; specifically relate to text information; act as visual aid to the narrative; pictures enhance what is written and sometimes even stand on their own as explanations.
- Text size is appropriate for reading.
- Lots of great eye appeal that creates interest, encourages reader to continue.
- Concise, not too thick, so not too imposing ("not a novel!")
- Not too technical; not dry.
- Quality of paper is good; looks like quality with valuable content; matte finish is good for reading; and it's not seen as junk mail (so do not tone it down to recycled paper quality).
- Content tone is not patronizing, doesn't talk "up" or "down" to the reader.
- Like the standardized Cows and Fish sidebar.

- Like mix of graphic boxes.
- Visuals show differences between healthy and unhealthy.
- Much more interesting than other fact sheets “out there”.
- Seen as becoming repetitious for more experienced users/managers, but recognized as appropriate for introductory information to more general readers.
- Minority view that they are too “busy”; try to tell too much in too short a space; becomes confusing with too many graphic components.

Impact on Awareness

- Can learn what riparian areas are and what they do; why healthy ones are important.
- Shows differences between healthy and unhealthy riparian areas.
- Shows agricultural producers as proactive.
- Good as introductory tools.
- OK for general public.
- May be most appropriate for young audiences because of visual appeal.
- Understood to be geared to early users; likely won't impact if “preaching to the converted”.
- Probably little impact on people who are already interested/involved in riparian issues.
- Other than the Producer Stories, they can be shared with neighbours [non-agricultural participant] so they can learn, too.
- Introduces the idea of considering the watershed, not just your own place.

Impact on Management

- Does not necessarily trigger action but it was understood that action is not necessarily the purpose; does encourage the reader to seek more information relating to possible action.
- Seen as the starting point to make people aware.
- Recognize that motivation is very specific to the individual.
- Provides some examples of actions.

Comments Specific To the Fact Sheets

Lakes and Wetlands

- Too many pictures, too distracting, too busy.
- A “city person” might be more attracted to more pictures of boats, since that is often their experience with lakes.
- Passive language was noted, for example talks about plants as rebar, but does not say “go and plant some”.
- Learned new information, for example terminology/definitions/relevance of, for example, eutrophic.
- Need to clarify extent and degree of eutrophication as it applies to most Alberta lakes (being two different concepts which may confuse the reader).

People and Riparian Biodiversity

- Description of biodiversity is excellent in terms of its ability to communicate to the general public.
- This could be an introductory Fact Sheet to the suite of Fact Sheets, with biodiversity being the common theme throughout to reinforce its importance.
- Good level of detail; good as a “starter”.
- Learned that it is important to leave the shoreline in a natural state.

Producer Stories

- More motivational than *Lakes and Wetlands* and *People and Riparian Biodiversity*.
- “If he can do it, I can do it.”
- Reinforces that someone is doing something; almost more meaningful than the dry facts on their own.
- Individuals show-cased as “reasonable people”.
- Gets at the “how” by outlining specific actions (removing cattle, altering herd size); compared to the biodiversity Fact Sheet which is less easy to apply, i.e. “how or what should I do”, because it is more conceptual in nature.
- Links the action to longer-term results and benefits, as well as personal wealth.
- Explains that cows and the environment can co-exist.
- May make a producer reconsider existing practices.
- Some uncertainty about the cost of the practices being described.
- Need lots of these (i.e. various stories).
- Learned that it doesn’t have to be expensive to make changes.
- Learned that there are different strategies available for action.
- Learned that time-controlled grazing doesn’t mean the area is unavailable to you forever.
- Seems to focus on large-scale operations; not so relevant/applicable to small operators, so may not motivate the person with only 200 acres if the strategies suggested don’t seem applicable.

Water Quality and Riparian Areas

- Has a helpful “how could I help” section which would be useful in other Fact Sheets; emphasize that by “people” it means “you” - “don’t just hint at it, say it straight out”.
- Learned about leaving natural vegetation.

4.2.2 Opportunities for Improvement

- A minority view that the Fact Sheets are “too busy”; trying to say too much in a short space.
- Possibly use a little less colour; there are too many graphic components in the available space - can put the reader off; needs fewer “blocks” of colour.
- Too many pictures distract from the information to be learned.
- Too much mixing of fonts (“serif and sans-serif shouldn’t be mixed”, in the view of one participant).

- Emphasize the ease of change by specifically saying “that was easy!” in relation to any management options shown.
- May be possible to reduce duplication of common messages across the suite of Fact Sheets by reducing the number of Fact Sheets.
- Consider numbering the series/issues of Fact Sheets.
- Make them simpler, less text is better.
- Emphasize or relate the biodiversity message in all the Fact Sheets to link them to the excellent definition contained in the Biodiversity Fact Sheet, to emphasize its importance and its role.
- Ensure that examples and strategies are relevant to small operators as well.

4.2.3 Summary

The Fact Sheets were seen as very effective introductory tools, where their purpose is to communicate basic concepts particular to each topic covered by the respective document. Their appealing aspects included that they are “reader-friendly”, visually attractive, not overly technical, and provide some introductory ideas about action that could be taken by an individual to improve riparian health and/or biodiversity. The tone of the text was deemed informative and constructive, and not patronizing. Further, text and photographs were well-matched and relevant, quickly communicating essential aspects of the topic being covered. This positive feedback was balanced by acknowledging that there is an appropriate place for this type of introductory tool, and that it likely cannot and should not attempt to overwhelm the first-time reader with too much information. While it was observed that in and of themselves, no particular Fact Sheet will lead to significant behaviour change, since they do not deal specifically with action options, recognition was given that the Fact Sheets act as a meaningful starting point in the continuum of awareness-building.

Notwithstanding, some suggestions for strengthening the Fact Sheets included attempting to reduce the “busy-ness” of some of the graphic elements, reducing duplication of messages where possible, and using some of the content of the Biodiversity Fact Sheet as a common thread across all the Fact Sheets, since its treatment of the topic was found to be particularly well done, such that it may act as a foundation concept supporting all topics/Fact Sheets. Switching to active from passive language in terms of suggestions for action by individuals was seen as one mechanism to further promote management change, and to help address the reality that motivation is individual-specific. For example, switching to “plant some deep-rooted vegetation at the shoreline to strengthen the bank” rather than “deep roots strengthen the shoreline” suggests both the concept of bank stability and a specific action in the same sentence. This type of approach may go some distance to overcome the space limitations inherent to the Fact Sheets compared to lengthier documents such as the User’s Guide.

Another suggestion was to number the suite of Fact Sheets to indicate they are part of a package, as a way of placing each one in its appropriate context and of encouraging further interest in, and direction to, the various topics available in the suite of Fact Sheets. While elimination of some duplication of content across Fact Sheets was discussed, it was not fully agreed upon: that discussion should be considered in the light of only a small number of Fact Sheets being reviewed in the workshops.

A minority of individuals indicated they felt there was too much colour and too many graphic elements in the documents, but overall the visual elements were viewed as a very positive feature of the Fact Sheets, since they serve to both attract and keep interest.

4.3 BOOKLETS

4.3.1 Feedback on Riparian Areas: A User's Guide to Health

General observations about the User's Guide are set out below, followed by opportunities for improvement.

Content/Format

- Presentation is logical; easy to read.
- Like the structure, start to finish - can find what you are looking for about different topics including what riparian areas are; how to "grade" [assess] an area.
- Clear.
- Pictures are great; balanced with text.
- Like the before-after photos, especially historical ones; can be extremely "enlightening".
- Good quality paper; will tend to keep the document rather than discard it.
- Good balance of pictures to text; pictures lead the reader to go on.
- Like the "medical" analogies.
- Like the colours.
- Like the graphics and various motifs such as the green leaf, stethoscope -- serve to draw the reader's eye to the information.
- Like the assistance/program/agency information at the back.
- Doesn't seem to include a lot of information on damage done by urban development.

Impact on Awareness

- Makes you want to "fix it" by showing benefits of healthy areas, even though there aren't a lot of specific solutions offered.
- It's a "wake-up call" to do something, like attending a seminar or getting information about costs.
- Explains many key but basic concepts for first-time readers.
- Demonstrates the signs of unhealthy and healthy areas.
- Encourages people to be proactive on their own land, to take care of it by paying more attention.
- Illustrates that your area may not be as badly off as you thought.
- Emphasis seen as being awareness, and it is effective for that, not necessarily for action.
- Riparian self-assessment section seen as very valuable; demonstrates that you could have a lot of problems you're not aware of yet.
- Communicates the importance of balance in the ecosystem.
- Communicates that there are many ways to improve how you manage a watershed.

- Encourages you to look at your land with greater understanding and to see your impacts on the riparian area.
- Seen as a logical step after reading the briefer Fact Sheets.
- For the more experienced land manager, serves as a reminder that you're on the "right road".

Impact on Management

- Recognized that a person needs to be motivated first before action is taken, but that motivation is very individualized.
- Provides credible suggestions on how to evaluate a riparian area.
- Helps you to do a self-assessment.
- Overall, not a lot of suggestions for specific action if the area is determined to be "unhealthy", so doesn't address how to "fix" it - suggestions are missing or hard to find.
- Motivates the reader to fix the area, but maybe not enough to actually "do" the fix.
- If reader is more experienced or informed, may just be "speaking to the converted", so less likely to result in specific action.
- If you were "looking for some way to make change", this may fall somewhat short.
- Recognized that the booklet is designed to build toward action from the knowledge content presented in the first part of the book.

4.3.2 Opportunities for Improvement

- Paper is too shiny; can make it difficult to read in certain lights.
- Simplify visuals on some pages; a little "busy" now.
- More clarity as to who the audience(s) is/are.
- A little confusing to call it a "user's guide", when typically a user's guide would include specific actions, which in this booklet don't start to appear until page 37.
- Add more suggestions of action to take if your own riparian area is unhealthy, i.e. "how do I fix this?". Providing some solutions here maintains the link to the interest that has just been developed. Could be in this booklet or elsewhere (some concern about getting too "hefty" or overwhelming for some readers if all in one document).
- Maybe a "suggestion page" on, for example, fencing, tips/tricks about off-stream watering, simple first steps, or possibly separate tip sheets on these management actions.
- Show some actions that don't cost anything (or very little) but where benefits are high in comparison, to appeal to younger producers who may not have a lot of operating funds.
- Possibly separate the information relating to streams and lakes more clearly; these audiences may be different.
- May be hard to do the self-assessment without more information on plants [the plant booklet was not available to this group discussion].
- Possibly include a list of grants that can be accessed.
- Attempt to incorporate audience-specific information, for example rural vs. urban readers, agricultural vs. recreational, and youth audiences (4H clubs).

- Some text is a bit wordy and could be clarified.
- Try to emphasize role of peers more, since peer pressure is seen as a big motivator for people.

4.3.3 Summary

Overall, the User's Guide was seen as a very effective awareness tool that begins the process of leading to individual action, both in terms of its visual appeal and easy-to-understand content. It is suitable for "early-stage" readers because it explains basic concepts and how to recognize potential problems by carrying out the self-assessment procedure. However, additional information about specific management actions to "fix" potential problems, once identified, is needed. This information could be included in a revised User's Guide, but likely would be more practical and effective in a companion document that parallels the information in the current User's Guide by linking specific solutions to specific problems, for example using techniques such as those in community-based social marketing. This modification would maintain the foundation of awareness-building that is necessary to peak interest and motivation, yet not overwhelm the reader by too hefty a "manual", since the User's Guide is already beginning to be seen as "too much information". Further, by structuring the information more clearly to target audience(s) or experience levels, the two separate tools will be effective both as stand-alone documents or as a suite of tools, depending on an individual's circumstances and current level of interest/awareness. Developing a companion document may, therefore, go some distance to alleviating the common feedback heard in Cows and Fish evaluations that more action-oriented tools would be helpful while, at the same time, building on the momentum of interest once developed.

Note, however, that the design intent of the User's Guide was not as a "how-to-fix-it" manual; rather, its purpose has been to help readers recognize what riparian health looks like, as the name suggests. Accordingly, participant feedback suggests that the booklet achieves that goal.

One workshop participant volunteered to offer some specific edit suggestions for the User's Guide. These are attached as Appendix E.

4.4 DIGITAL STORIES

4.4.1 Feedback on the Suite of Stories

Table 34 sets out the feedback provided by participants about five digital stories video-screened at the workshops, detailing what aspects of the tool were liked and disliked. Participants also articulated what information they took away from each story, and in some instances commented on whether the story was motivational. Potential future uses of the stories were also identified in terms of audiences where they could be used effectively. The table distinguishes those stories produced by landowners and those produced by Cows and Fish staff.

TABLE 34
MATRIX OF DIGITAL STORY IMPACT

Title	Like	Dislike	Messages (awareness)
Landowner Stories			
Learning to Listen	<ul style="list-style-type: none"> Reflects reality Can relate (more than the pack-horse story) Shows what was being done Really hit home; new ways vs. old ways, which is a common situation It draws you in, leads up well to, for example, Big Hats, Rubber Boots and All Shows new ways can work 	<ul style="list-style-type: none"> Negative tone except at end Invasive activity, back-hoe - reminds of oil industry Suggests you can/should improve your land with bigger technology A bit scripted 	<ul style="list-style-type: none"> Listen Ultimately showed what the end-product looked like
Mac Made Me Do It	<ul style="list-style-type: none"> The black and white transition to colour The old pictures Very positive at the end Very visual and simple, so appealing 	<ul style="list-style-type: none"> Too long A bit boring Pictures not related to story; harder to follow what is happening Not sure of relevance 	<ul style="list-style-type: none"> You can learn a lot from old people A long-ago message applicable to today Listen
My Alberta Home	<ul style="list-style-type: none"> It's the common man speaking; it doesn't have to refer to your own place for you to relate It hits home 		<ul style="list-style-type: none"> Breaking my heart to see the change on the land I'm not the only one who feels this way There's a problem and we're ignoring it Can't stop change Why would someone unwittingly destroy a beautiful lake?
Cows and Fish Staff Stories			
What's In a Name	<ul style="list-style-type: none"> The talk about the grass; was disappointed when the story ended 		<ul style="list-style-type: none"> "Cool stuff" about overgrazing causing loss of good plants Nature doesn't like a void; it will fill it with something
Big Hats, Rubber Boots and	<ul style="list-style-type: none"> It was a personalized story Desire to share 	<ul style="list-style-type: none"> Makes you enthusiastic 	<ul style="list-style-type: none"> You can learn something and it's worthwhile sharing it

TABLE 34
MATRIX OF DIGITAL STORY IMPACT

All	learning <ul style="list-style-type: none"> ▪ A better link to Cows and Fish than landowner stories ▪ Enthusiastic ▪ The language, did not sound scripted ▪ Very visual, lots of good pictures 		<ul style="list-style-type: none"> ▪ The more you learn, the more you'll protect something ▪ Can move forward ▪ You can see the riparian area by "seeing" what the narrator sees ▪ Visuals of bugs and animals, and dead debris, puts a new light on this not being a "mess" ▪ Appreciation and understanding of what the riparian area is
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4.4.2 Summary

The following general observations were made about the digital stories. All should be considered in light of the fact that the stories viewed at the workshops were still in draft form.

- Overall response to the digital story as an awareness tool was very positive, with minor exceptions about the relevance of some content.
- Their utility was supported by many suggested uses and audiences (see below). Further, some workshop participants enquired about developing their own stories for use in their communities, an indicator of serious interest that supports the view that the tool was seen as being of value.
- The stories were, for the most part, seen as effective at initially drawing in the viewer's interest, particularly those in which there was a specific operating situation (change in management or land use) that the viewer could relate to personally.
 - The stories were emotive, and hence appealing, showing situations that people could relate to their own situation or their own life, for example different values within families or communities.
 - The stories were seen as a good way to "get the story across", both in terms of visual appeal and the personalized approach.
- One individual described the digital stories as being "like an encyclopedia of ideas for people".
- There were varying views on the length; some felt they were too long, others felt they were too short.

- While seen as useful tools, some discussion highlighted the challenges in making them available to appropriate audiences because of the need to access a digital format and, for example, file size. Several mentions were made that the tool would, therefore, likely be most useful with a younger audience.

The following suggestions were made for potential uses of the digital story as an awareness tool. The high number of potential audiences or delivery methods identified suggests that real value was seen in their use.

- Eco-Day shows
- TV vignettes (possibly shorter versions)
- Classroom presentations/curriculum (including making their own story)
- Use *Learning to Listen* at high school graduation time
- Watershed group meetings
- Cows and Fish website, and related links (possible use of pop-ups)
- Cows and Fish presentations
- You-Tube
- Demonstration tours
- Trade shows (as a running loop)

4.5 **CONCLUSION**

The evaluation of the print awareness tools uncovered a number of both strengths and suggested improvements, which are detailed in this report. Overall, however, it is important to state that each of the three classes of tool examined in this evaluation generally mirrors the types of audiences that Cows and Fish typically attempts to reach and work with. A logical way to describe these audience types is by level of experience or exposure to the Cows and Fish program and its messages: individuals loosely classed as Beginner, Intermediate, and Advanced. In terms of depth of information and motivation to take action, the Fact Sheets are generally suitable for Beginners, providing the first program step of building awareness for different user groups, whether urban, rural, agricultural or recreational property owners, and so on. The User's Guide is suitable primarily for Intermediate users, mostly in agriculture, since it provides greater explanation of riparian and biodiversity concepts and an introduction to management practices and potential solutions. Notwithstanding its effectiveness in meeting the needs of Intermediate audiences, the User's Guide falls short of meeting the needs of Advanced users, who seek specific and detailed management planning and technical information to address problems they have identified and which they are motivated to fix. Nor does it appeal as strongly to non-agricultural users, since its content is largely focused on agriculture. This finding is consistent with findings in other Cows and Fish evaluations, where a need for specific problem-solving technical tools was identified. Evaluation of tools that may currently exist within the broader Cows and Fish suite of tools that may address these requirements was not undertaken, since doing so fell outside the scope of this project.

While a set of recommendations specific to the tool format and content are provided in this report, the fundamental groupings that make up the suite of awareness tools does not require change, based on the tools examined in this evaluation.

APPENDIX A
BASELINE BIODIVERSITY KNOWLEDGE
SURVEY INSTRUMENT



WELCOME

On behalf of Cows and Fish, thank you for completing this brief survey.

The information you provide will be used by Cows and Fish to develop new education materials. The goal is to help increase understanding about Alberta's landscapes and waterbodies among landowners and the general public.

There are 24 questions in this survey and it should take about 10 minutes for you to complete.

Your knowledge, time and effort are appreciated!

Cows and Fish - January 2008 Survey

YOUR PLACE, AND HOW YOU PREFER TO MANAGE IT

To begin, please give us some background about yourself and your place, as well as a little information about some of your management preferences.

1. Which of the following categories best describes the place you'd like to talk about today?

[CHOOSE ONE]

☐ Country residential property or non-agricultural lot where you live full-time

☐ Recreational property that you use part-time

☐ Primarily a livestock operation

☐ Primarily a cropping/haying operation (including specialty)

☐ Mixed farming operation

☐ Other (please specify)

2. Does the place you chose in Question #1 have any of the following?

[CHOOSE ANY THAT APPLY]

☐ Constructed dugouts only

☐ Stream(s) or river(s)

☐ Lake(s)

☐ Wetlands such as sloughs, ponds and/or springs

☐ Your place does not have any natural waterbodies

3. Please answer this question if you CROP or HAY on your place. Otherwise, please skip ahead to Question #4.

	Yes	No	Not sure / Don't know
Do you have a formal Integrated Crop Plan?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you have a formal Nutrient Management Plan?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you use low/zero till and/or direct seeding?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you use a flushing bar on your field machinery?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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4. Please answer this question if you are a LIVESTOCK producer.
Otherwise, please skip ahead to Question #5.

	Yes	No	Not sure / Don't know
Do you have a formal Grazing Management Plan?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you have a formal Nutrient Management Plan?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you use developed off-stream watering system(s)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you adjust the grazing period when forage plants start their regrowth?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(Answer only if you have waterbodies other than constructed dugouts): Do you have native/natural vegetation around watering points?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Please answer this question if your place is a COUNTRY RESIDENTIAL and/or RECREATIONAL property.
Otherwise, please skip ahead to Question #6.

	Yes	No	Not sure / Don't know
Do plants such as lawn grass make up less than one-quarter of all the plants on your place?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Are more than half of the plants on your property as tall as your knees?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you often see wildlife on your place?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you often see birds on your place?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. At this time, does your place have any SHELTERBELTS / WOODLOTS?

☐ Yes (please continue to Questions #7 and #8)

☐ No (please skip ahead to Question #9)

☐ Not sure / Don't know

7. If you answered YES, how did these shelterbelts/woodlots come to be on your place?

[CHOOSE ANY THAT APPLY]

☐ Some are naturally occurring

☐ Some were planted by a previous owner(s) and/or family member(s)

☐ You planted some

8. If you answered YES, please indicate the reasons for having them.

[CHOOSE ANY THAT APPLY]

☐ You have them, but you'd like to get rid of them

☐ You keep them because they are nice to look at

☐ You keep them because they provide windbreaks

☐ You keep them because they protect against erosion

☐ You keep them because they trap snow/moisture

☐ You keep them because they provide habitat

☐ You keep them because they provide recreational opportunities

☐ You keep them because they provide a financial return

Other (please specify)

9. If you answered NO, please indicate the reasons for NOT having shelterbelts and/or woodlots.

[CHOOSE ANY THAT APPLY]

☐ There never were any, that you know of

☐ It's just too dry for them

☐ It's not important to you to have any

☐ You would like to have some but it is too expensive or difficult to create them

☐ There were, but some/all were removed because you prefer to see open, unobstructed views

☐ There were, but some/all were removed for farming operations

☐ There were, but some/all were removed for new housing

☐ There were, but some/all were removed for industrial or road development

Other (please specify)

10. At this time, does your place have any NATURAL WETLANDS (excluding constructed dugouts) such as sloughs, ponds and/or springs?

☐ Yes (please continue to Questions #11 and #12)

☐ No (please skip ahead to Question #13)

☐ Not sure / Don't know

11. If you answered YES, how did these natural wetlands come to be on your place?

[CHOOSE ANY THAT APPLY]

	Yes	No	Not sure / Don't know
Some/all have always been there	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Some/all were previously drained but have been restored/reclaimed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Some/all are constructed (excluding dugouts)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. If you answered YES, please indicate the reasons for having these natural wetlands.

[CHOOSE ANY THAT APPLY]

☐ They've just always been there

☐ They've been reclaimed/restored and/or constructed

☐ They are nice to look at

☐ They contribute to water supply

☐ They provide habitat

☐ They provide recreational opportunities

Other (please specify)

13. If you answered NO, please indicate the reasons for NOT having natural wetlands.

[CHOOSE ANY THAT APPLY]

☐ There never were any that you know of

☐ There were some, but all were removed for farming operations

☐ There were some, but all were removed for new housing

☐ There were some, but all were removed for industrial or road development

☐ Other (please specify)

14. When making decisions about activities on your place, do potential negative impacts on any of the following play a big role in what you decide to do?

[CHOOSE ANY THAT APPLY]

- ☐ Fish
- ☐ Birds
- ☐ Mammals
- ☐ Other wildlife such as insects and amphibians
- ☐ Native grass
- ☐ Trees and/or shrubs
- ☐ Water quality and/or quantity
- ☐ None of the above

Cows and Fish - January 2008 Survey

YOUR VIEWS ON SOME LAND AND WATER MANAGEMENT IDEAS

Please indicate how do you feel about the following ideas, which some people feel can present challenges for landowners.

There is no right or wrong answer. Rather, we're interested in what is important to you.

15. Please indicate whether you agree or disagree.

	Agree	Disagree	Not sure / Don't know
As an individual, you have the ability to play an important role in the health of the watershed you live in.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rural landowners face unfair pressures and costs because of society's expectations about the quality of the natural environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Society as a whole benefits from any conservation efforts you make on your place, so society should pay the bill for them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The current health of the environment on your place is pretty much your responsibility.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wetlands really limit a producer's ability to farm productively and profitably.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. And what do you think about these ideas?

	Agree	Disagree	Not sure / Don't know
Wetlands and bush areas are essential to providing good habitat for plants, insects, amphibians, birds and other wildlife.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A wide variety of insects on your place indicates an ecosystem at risk.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alberta has about the right amount of good habitat for fish and wildlife.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Keeping lots of birds and other wildlife on your place helps keep your watershed in good shape.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Cows and Fish - January 2008 Survey

YOU'RE ALMOST DONE! JUST FOUR MORE QUESTIONS ABOUT LAND AND WATER...

Please think about the following concepts and provide your best estimate of the most accurate definition.

17. Which of the following descriptions do you feel is the best definition of a RIPARIAN AREA?

- ☐ A waterbody such as a lake, wetland, spring, stream or river
- ☐ An area with water-loving vegetation that borders a lake, wetland, spring, stream or river
- ☐ An upland located away from the water
- ☐ Not sure / Don't know

18. Which of the following descriptions do you feel is the best definition of BIODIVERSITY?

- ☐ An environment's ability to support the greatest number of people and their livelihoods
- ☐ The variety and type of plant and animal life found in a natural environment
- ☐ A way of describing an environment when it has lots of plants, animals and ecosystems that are similar to each other
- ☐ Not sure / Don't know

19. The following ideas relate specifically to biodiversity. Even if you're not really familiar with the concept of biodiversity, try to give what you think is a reasonable answer.

	Yes	No	Not sure / Don't know
Biodiversity is important to you	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biodiversity is essential to your long-term economic well-being	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biodiversity is in good shape in Alberta	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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20. Please indicate whether each of the following is true or false.

	True	False	Not sure / Don't know
Allowing natural species to travel easily across landscapes is a good way to help maintain genetic variety within their populations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The greater the number of plant species in an area, the greater the risk posed to them by disturbances such as fire, disease and pests.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thick and tangled vegetation along the water's edge helps that waterbody to trap sediment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most fish, bird and animal species prefer sparse vegetation cover to help them easily see predators and potential food sources.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Proactively managing waterbodies and areas adjacent to them helps to increase forage productivity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grazing a pasture continuously from spring through to fall is one way to help maintain habitat for most bird species.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Keeping the banks and shores around lakes nicely manicured helps keep the water clean.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dead or dying woody vegetation left along banks and shores increases toxins in the water.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Streams that are narrow and deep tend to provide a more sustainable water supply for people, livestock and wildlife compared to streams that are wide and shallow.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Landscapes around waterbodies are most productive when all the plant species are about the same age.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Riparian areas represent less than 5% of Alberta's landscapes so play a very small role in watershed health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More than 3/4 of Canada's birds need areas that border waterbodies for some part of their lifecycle.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

... AND LASTLY

21. HOW MUCH contact do you estimate you have had with the Cows and Fish program?

[CHOOSE ONE]

- ☐ None, until you heard about this workshop
- ☐ Very little contact
- ☐ A moderate amount of contact
- ☐ A lot of frequent or in-depth contact

22. Which of the following categories best describes the TYPE of contact you've had with the Cows and Fish program?

[CHOOSE ONE]

- ☐ None before today
- ☐ Your ONLY contact has been by telephone
- ☐ Your ONLY contact has been by personal on-site visit(s)
- ☐ Your ONLY contact has been through your participation at instructional field days held OUTDOORS
- ☐ Your ONLY contact has been through your attendance at community meetings/workshops held INDOORS
- ☐ You've had contact through TWO or THREE of the above
- ☐ You've had contact through ALL of the above

Other (please specify)

23. Which of the following categories includes your age?

- ☐ 20-39 years
- ☐ 40-59 years
- ☐ 60-79 years
- ☐ 80 or older

24. What municipality do you live in?

(e.g. MD of Willow Creek, City of Edmonton, Red Deer County)

Cows and Fish - January 2008 Survey

YOU'RE DONE !!!

On behalf of Cows and Fish, THANK YOU for providing your valuable feedback. Please hand this survey into your workshop facilitator now.

This survey is being administered and analyzed independently for Cows and Fish by IMI strategics, a public consultation company based in Edmonton.

If you have questions about this survey, please call Nancy at (780) 420-1646 or email nancy@imistrategics.ca

THANK YOU!

Alberta Riparian Habitat Management Society



APPENDIX B
BASELINE BIODIVERSITY KNOWLEDGE
TABULAR DATA CHARTS



Cows and Fish Prelim Survey Jan 2008

1. Which of the following categories best describes the place you'd like to talk about today? [CHOOSE ONE]			
		Response Percent	Response Count
Country residential property or non-agricultural lot where you live full-time	<div><div></div></div>	7.1%	2
Recreational property that you use part-time	<div><div></div></div>	21.4%	6
Primarily a livestock operation	<div><div></div></div>	42.9%	12
Primarily a cropping/haying operation (including specialty)	<div><div></div></div>	3.6%	1
Mixed farming operation	<div><div></div></div>	17.9%	5
Other (please specify)	<div><div></div></div>	14.3%	4
	answered question		28
	skipped question		0

2. Does the place you chose in Question #1 have any of the following? [CHOOSE ANY THAT APPLY]			
		Response Percent	Response Count
Constructed dugouts only	<div><div></div></div>	25.0%	7
Stream(s) or river(s)	<div><div></div></div>	67.9%	19
Lake(s)	<div><div></div></div>	28.6%	8
Wetlands such as sloughs, ponds and/or springs	<div><div></div></div>	78.6%	22
Your place does not have any natural waterbodies	<div><div></div></div>	10.7%	3
	answered question		28
	skipped question		0

3. Please answer this question if you CROP or HAY on your place. Otherwise, please skip ahead to Question #4.				
	Yes	No	Not sure / Don't know	Response Count
Do you have a formal Integrated Crop Plan?	14.3% (2)	78.6% (11)	7.1% (1)	14
Do you have a formal Nutrient Management Plan?	13.3% (2)	73.3% (11)	13.3% (2)	15
Do you use low/zero till and/or direct seeding?	50.0% (7)	50.0% (7)	0.0% (0)	14
Do you use a flushing bar on your field machinery?	7.1% (1)	71.4% (10)	21.4% (3)	14
	<i>answered question</i>			15
	<i>skipped question</i>			13

4. Please answer this question if you are a LIVESTOCK producer. Otherwise, please skip ahead to Question #5.				
	Yes	No	Not sure / Don't know	Response Count
Do you have a formal Grazing Management Plan?	60.0% (9)	40.0% (6)	0.0% (0)	15
Do you have a formal Nutrient Management Plan?	20.0% (3)	73.3% (11)	6.7% (1)	15
Do you use developed off-stream watering system(s)?	64.3% (9)	35.7% (5)	0.0% (0)	14
Do you adjust the grazing period when forage plants start their regrowth?	73.3% (11)	6.7% (1)	20.0% (3)	15
(Answer only if you have waterbodies other than constructed dugouts): Do you have native/natural vegetation around watering points?	100.0% (14)	0.0% (0)	0.0% (0)	14
	<i>answered question</i>			15
	<i>skipped question</i>			13

5. Please answer this question if your place is a COUNTRY RESIDENTIAL and/or RECREATIONAL property. Otherwise, please skip ahead to Question #6.				
	Yes	No	Not sure / Don't know	Response Count
Do plants such as lawn grass make up less than one-quarter of all the plants on your place?	55.6% (5)	22.2% (2)	22.2% (2)	9
Are more than half of the plants on your property as tall as your knees?	75.0% (6)	25.0% (2)	0.0% (0)	8
Do you often see wildlife on your place?	87.5% (7)	12.5% (1)	0.0% (0)	8
Do you often see birds on your place?	100.0% (8)	0.0% (0)	0.0% (0)	8
	answered question			9
	skipped question			19

6. At this time, does your place have any SHELTERBELTS / WOODLOTS?			
		Response Percent	Response Count
Yes (please continue to Questions #7 and #8)	<div><div></div></div>	88.9%	24
No (please skip ahead to Question #9)	<div><div></div></div>	11.1%	3
Not sure / Don't know		0.0%	0
	answered question		27
	skipped question		1

7. If you answered YES, how did these shelterbelts/woodlots come to be on your place? [CHOOSE ANY THAT APPLY]			
		Response Percent	Response Count
Some are naturally occurring	<div><div></div></div>	70.8%	17
Some were planted by a previous owner(s) and/or family member(s)	<div><div></div></div>	41.7%	10
You planted some	<div><div></div></div>	70.8%	17
	answered question		24
	skipped question		4

8. If you answered YES, please indicate the reasons for having them. [CHOOSE ANY THAT APPLY]			
		Response Percent	Response Count
You have them, but you'd like to get rid of them	<div><div></div></div>	4.2%	1
You keep them because they are nice to look at	<div><div></div></div>	62.5%	15
You keep them because they provide windbreaks	<div><div></div></div>	95.8%	23
You keep them because they protect against erosion	<div><div></div></div>	66.7%	16
You keep them because they trap snow/moisture	<div><div></div></div>	79.2%	19
You keep them because they provide habitat	<div><div></div></div>	79.2%	19
You keep them because they provide recreational opportunities	<div><div></div></div>	25.0%	6
You keep them because they provide a financial return	<div><div></div></div>	8.3%	2
	Other (please specify)		0
	answered question		24
	skipped question		4

9. If you answered NO, please indicate the reasons for NOT having shelterbelts and/or woodlots. [CHOOSE ANY THAT APPLY]			
		Response Percent	Response Count
There never were any, that you know of	<div><div></div></div>	100.0%	1
It's just too dry for them		0.0%	0
It's not important to you to have any		0.0%	0
You would like to have some but it is too expensive or difficult to create them		0.0%	0
There were, but some/all were removed because you prefer to see open, unobstructed views		0.0%	0
There were, but some/all were removed for farming operations		0.0%	0
There were, but some/all were removed for new housing		0.0%	0
There were, but some/all were removed for industrial or road development		0.0%	0
Other (please specify)			3
	answered question		1
	skipped question		27

10. At this time, does your place have any NATURAL WETLANDS (excluding constructed dugouts) such as sloughs, ponds and/or springs?			
		Response Percent	Response Count
Yes (please continue to Questions #11 and #12)	<div><div></div></div>	76.9%	20
No (please skip ahead to Question #13)	<div><div></div></div>	23.1%	6
Not sure / Don't know		0.0%	0
	answered question		26
	skipped question		2

11. If you answered YES, how did these natural wetlands come to be on your place? [CHOOSE ANY THAT APPLY]				
	Yes	No	Not sure / Don't know	Response Count
Some/all have always been there	100.0% (20)	0.0% (0)	0.0% (0)	20
Some/all were previously drained but have been restored/reclaimed	10.0% (1)	70.0% (7)	20.0% (2)	10
Some/all are constructed (excluding dugouts)	46.2% (6)	38.5% (5)	15.4% (2)	13
	answered question			20
	skipped question			8

12. If you answered YES, please indicate the reasons for having these natural wetlands. [CHOOSE ANY THAT APPLY]			
		Response Percent	Response Count
They've just always been there	<div><div></div></div>	80.0%	16
They've been reclaimed/restored and/or constructed	<div><div></div></div>	25.0%	5
They are nice to look at	<div><div></div></div>	45.0%	9
They contribute to water supply	<div><div></div></div>	70.0%	14
They provide habitat	<div><div></div></div>	80.0%	16
They provide recreational opportunities	<div><div></div></div>	25.0%	5
Other (please specify)			1
answered question			20
skipped question			8

13. If you answered NO, please indicate the reasons for NOT having natural wetlands. [CHOOSE ANY THAT APPLY]			
		Response Percent	Response Count
There never were any that you know of	<div><div></div></div>	83.3%	5
There were some, but all were removed for farming operations		0.0%	0
There were some, but all were removed for new housing		0.0%	0
There were some, but all were removed for industrial or road development		0.0%	0
Other (please specify)	<div><div></div></div>	16.7%	1
answered question			6
skipped question			22

14. When making decisions about activities on your place, do potential negative impacts on any of the following play a big role in what you decide to do? [CHOOSE ANY THAT APPLY]				
			Response Percent	Response Count
	Fish	<div></div>	40.0%	10
	Birds	<div></div>	76.0%	19
	Mammals	<div></div>	72.0%	18
	Other wildlife such as insects and amphibians	<div></div>	52.0%	13
	Native grass	<div></div>	76.0%	19
	Trees and/or shrubs	<div></div>	80.0%	20
	Water quality and/or quantity	<div></div>	88.0%	22
	None of the above	<div></div>	4.0%	1
	answered question			25
	skipped question			3

15. Please indicate whether you agree or disagree.				
	Agree	Disagree	Not sure / Don't know	Response Count
As an individual, you have the ability to play an important role in the health of the watershed you live in.	100.0% (28)	0.0% (0)	0.0% (0)	28
Rural landowners face unfair pressures and costs because of society's expectations about the quality of the natural environment.	57.1% (16)	42.9% (12)	0.0% (0)	28
Society as a whole benefits from any conservation efforts you make on your place, so society should pay the bill for them.	51.9% (14)	33.3% (9)	14.8% (4)	27
The current health of the environment on your place is pretty much your responsibility.	82.1% (23)	7.1% (2)	10.7% (3)	28
Wetlands really limit a producer's ability to farm productively and profitably.	7.1% (2)	78.6% (22)	14.3% (4)	28
	answered question			28
	skipped question			0

16. And what do you think about these ideas?				
	Agree	Disagree	Not sure / Don't know	Response Count
Wetlands and bush areas are essential to providing good habitat for plants, insects, amphibians, birds and other wildlife.	100.0% (27)	0.0% (0)	0.0% (0)	27
A wide variety of insects on your place indicates an ecosystem at risk.	7.4% (2)	63.0% (17)	29.6% (8)	27
Alberta has about the right amount of good habitat for fish and wildlife.	11.1% (3)	70.4% (19)	18.5% (5)	27
Keeping lots of birds and other wildlife on your place helps keep your watershed in good shape.	77.8% (21)	3.7% (1)	18.5% (5)	27
	answered question			27
	skipped question			1

17. Which of the following descriptions do you feel is the best definition of a RIPARIAN AREA?			
		Response Percent	Response Count
A waterbody such as a lake, wetland, spring, stream or river	<div><div></div></div>	7.1%	2
An area with water-loving vegetation that borders a lake, wetland, spring, stream or river	<div><div></div></div>	85.7%	24
An upland located away from the water	<div><div></div></div>	7.1%	2
Not sure / Don't know		0.0%	0
	answered question		28
	skipped question		0




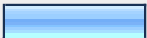
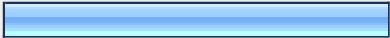
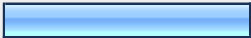
18. Which of the following descriptions do you feel is the best definition of BIODIVERSITY?			
		Response Percent	Response Count
An environment's ability to support the greatest number of people and their livelihoods	<div></div>	0.0%	0
The variety and type of plant and animal life found in a natural environment	<div></div>	64.3%	18
A way of describing an environment when it has lots of plants, animals and ecosystems that are similar to each other	<div></div>	25.0%	7
Not sure / Don't know	<div></div>	10.7%	3
	answered question		28
	skipped question		0

19. The following ideas relate specifically to biodiversity. Even if you're not really familiar with the concept of biodiversity, try to give what you think is a reasonable answer.				
	Yes	No	Not sure / Don't know	Response Count
Biodiversity is important to you	92.6% (25)	0.0% (0)	7.4% (2)	27
Biodiversity is essential to your long-term economic well-being	66.7% (18)	7.4% (2)	25.9% (7)	27
Biodiversity is in good shape in Alberta	7.7% (2)	61.5% (16)	30.8% (8)	26
	answered question			28
	skipped question			0

20. Please indicate whether each of the following is true or false.				
	True	False	Not sure / Don't know	Response Count
Allowing natural species to travel easily across landscapes is a good way to help maintain genetic variety within their populations.	96.3% (26)	0.0% (0)	3.7% (1)	27
The greater the number of plant species in an area, the greater the risk posed to them by disturbances such as fire, disease and pests.	14.3% (4)	78.6% (22)	7.1% (2)	28
Thick and tangled vegetation along the water's edge helps that waterbody to trap sediment.	85.2% (23)	3.7% (1)	11.1% (3)	27
Most fish, bird and animal species prefer sparse vegetation cover to help them easily see predators and potential food sources.	3.6% (1)	96.4% (27)	0.0% (0)	28
Proactively managing waterbodies and areas adjacent to them helps to increase forage productivity.	82.1% (23)	3.6% (1)	14.3% (4)	28
Grazing a pasture continuously from spring through to fall is one way to help maintain habitat for most bird species.	0.0% (0)	96.4% (27)	3.6% (1)	28
Keeping the banks and shores around lakes nicely manicured helps keep the water clean.	0.0% (0)	100.0% (28)	0.0% (0)	28
Dead or dying woody vegetation left along banks and shores increases toxins in the water.	3.6% (1)	78.6% (22)	17.9% (5)	28
Streams that are narrow and deep tend to provide a more sustainable water supply for people, livestock and wildlife compared to streams that are wide and shallow.	39.3% (11)	46.4% (13)	14.3% (4)	28
Landscapes around waterbodies are most productive when all the plant species are about the same age.	0.0% (0)	92.9% (26)	7.1% (2)	28
Riparian areas represent less than				

5% of Alberta's landscapes so play a very small role in watershed health.	10.7% (3)	85.7% (24)	3.6% (1)	28
More than 3/4 of Canada's birds need areas that border waterbodies for some part of their lifecycle.	82.1% (23)	0.0% (0)	17.9% (5)	28
	answered question			28
	skipped question			0

21. HOW MUCH contact do you estimate you have had with the Cows and Fish program? [CHOOSE ONE]			
		Response Percent	Response Count
None, until you heard about this workshop	<div><div></div></div>	3.6%	1
Very little contact	<div><div></div></div>	21.4%	6
A moderate amount of contact	<div><div></div></div>	53.6%	15
A lot of frequent or in-depth contact	<div><div></div></div>	21.4%	6
	answered question		28
	skipped question		0

22. Which of the following categories best describes the TYPE of contact you've had with the Cows and Fish program? [CHOOSE ONE]			
		Response Percent	Response Count
None before today		7.7%	2
Your ONLY contact has been by telephone		3.8%	1
Your ONLY contact has been by personal on-site visit(s)		3.8%	1
Your ONLY contact has been through your participation at instructional field days held OUTDOORS		15.4%	4
Your ONLY contact has been through your attendance at community meetings/workshops held INDOORS		0.0%	0
You've had contact through TWO or THREE of the above		42.3%	11
You've had contact through ALL of the above		26.9%	7
Other (please specify)			4
answered question			26
skipped question			2

23. Which of the following categories includes your age?			
		Response Percent	Response Count
20-39 years		25.0%	7
40-59 years		50.0%	14
60-79 years		25.0%	7
80 or older		0.0%	0
answered question			28
skipped question			0

24. What municipality do you live in? (e.g. MD of Willow Creek, City of Edmonton, Red Deer County)		
		Response Count
		28
	<i>answered question</i>	28
	<i>skipped question</i>	0

APPENDIX C
BASELINE BIODIVERSITY KNOWLEDGE
SELECTED CROSS-TABULATIONS



These cross-tabular data are inconclusive due to low number of responses; they are presented for the sake of completeness and for information purposes only.

Correct response on: Defining biodiversity, vs:				
	Agree	Disagree	Not Sure / Don't Know	
The current health of the environment on your place is your responsibility	83% (n=15)	6% (n=6)	11% (n=2)	
	Yes	No	Not Sure / Don't Know	
Biodiversity is essential to your long-term economic wellbeing.	78% (n=14)	6% (n=1)	16% (n=3)	
Biodiversity is in good shape in Alberta.	5% (n=1)	65% (n=11)	30% (n=5)	
Have a formal Grazing Plan	63% (n=5)	37% (n=3)	0 (n=0)	
Have a formal Nutrient Management Plan	13% (n=1)	74% (n=6)	13% (n=1)	
	Lots/frequent/ In-depth	Moderate	Very Little	None
Amount of Contact with Cows and Fish	28% (n=5)	55% (n=10)	11% (n=2)	6% (n=1)

Correct response on: Defining riparian, vs:			
	Yes	No	Not Sure / Don't Know
Have a formal Nutrient Management Plan	0% (n=0)	87% (n=7)	13% (n=1)

Correct response on: As an individual, you have the ability to play an important role in the health of the watershed you live in, vs:			
	Agree	Disagree	Not Sure / Don't Know
Keeping lots of birds and other wildlife on your place helps keep your watershed in good shape.	78% (n=21)	4% (n=1)	18% (n=5)
The current health of the environment on your place is pretty much your responsibility.	82% (n=23)	7% (n=2)	11% (n=3)

Correct response on: The greater the number of plant species in an area, the greater the risk posed to them by disturbances such as fire, disease and pests, vs:

	Yes	No	Not Sure / Don't Know
Use flushing bar on field machinery	0% (n=0)	100% (n=2)	0% (n=0)
Adjust the grazing period when forage plants start their regrowth	100% (n=3)	0% (n=0)	0% (n=0)

Correct response on: Dead or dying woody vegetation left along banks and shores increases toxins in the water.

	Yes	No	Not Sure / Don't Know
Use off-site watering	80% (n=16)	20% (n=4)	0% (n=0)
Have a formal nutrient management plan	27% (n=3)	73% (n=8)	0% (n=0)

APPENDIX D
FOLLOW-UP BIODIVERSITY MESSAGE TESTING
SURVEY INSTRUMENT



1. WELCOME

ON BEHALF OF COWS AND FISH, THANK YOU FOR TAKING THE TIME TO COMPLETE THIS SURVEY, WHICH SHOULD TAKE 12-15 MINUTES TO FINISH.

The Cows and Fish program is developing new education materials to help increase understanding about Alberta's biological diversity, landscapes and waterbodies. This survey is a follow-up to an earlier survey and several workshops in which landowners shared their ideas and provided suggestions for Cows and Fish to more effectively communicate key concepts about biodiversity.

The purpose of this survey is, therefore, to obtain feedback on some potential new educational messages developed from that earlier feedback. Your input now will help determine the ways in which these potential messages are used in future educational materials and activities.

Thank you for helping us to gain a better understanding of how we can all contribute to landscape health.

PS: PLEASE FEEL FREE TO ADD ANY COMMENTS YOU MAY HAVE, IN THE SPACES PROVIDED AFTER EACH QUESTION, AND AT THE END OF THE SURVEY!

2. BUILDING AN UNDERSTANDING OF BIODIVERSITY

1. It is generally recognized that the more diverse an ecosystem is, the more stable, more resilient and better able it is to respond to disturbance (e.g. drought, flood, disease, etc.). So, a healthy landscape with many different native species is generally a good thing.

Which of the following statements gets across this idea most effectively?

CHOOSE ONE:

☐ Healthy, diverse ecosystems are more resilient to natural disturbance.

☐ More diverse ecosystems are more stable, more resilient and better able to respond to disturbance such as drought, flood or disease, and so a healthy landscape with many different species is a good thing.

☐ A healthy landscape with many different native species is generally a good thing because it is more resilient and better able to respond to natural disturbances or changes.

COMMENT?

2. In our recent Cows and Fish survey, almost one-third (31%) said they weren't sure or didn't know whether biodiversity is in good shape in Alberta. In many ways and in many places, it is not.

Which of the following statements most clearly communicates that biodiversity is at risk (that is, that it's not in good shape) in Alberta?

CHOOSE ONE:

☐ The greatest threat to biological diversity is loss of space and quality habitat due to intensive use (urban, recreational, industrial or agricultural), development, land-clearing or land conversion. With no place to exist, it's pretty hard for plants and animals to survive.

☐ Many walleye and northern pike populations in Alberta have crashed due to overfishing -- there are simply more fish taken than their populations can replace, which has led to changes in the fishing regulations to try to assist populations to recover.

☐ Alberta has numerous endangered and threatened species, mostly due to loss of habitat -- not enough suitable places left to live means these species are at risk of disappearing.

COMMENT?

3. About one-fifth of those recently surveyed said they did not know (or weren't sure) if keeping a lot of birds and other wildlife on their place also helps keep their watershed in good shape. Generally, a local area that supports lots of native birds and other wildlife is a healthy functioning ecosystem, compared to an area that doesn't -- meaning that the surrounding watershed is also more likely to be healthy.

Which of the following statements gets across this idea most effectively?

CHOOSE ONE:

☐ Fish and wildlife rely upon good quality habitat and functioning ecosystems to survive -- they can be good indicators of a healthy watershed.

☐ Having lots of native birds and other wildlife on your place is a good indicator that you are managing for a healthy landscape and watershed.

☐ A healthy watershed means the landscape is functioning in many ways, including supporting a diversity of native wildlife.

☐ Landscape integrity or health results from good management and land use decisions -- a healthy watershed will have a diversity of wildlife.

COMMENT?

3. ADDRESSING SOME MISCONCEPTIONS

4. One of the common misconceptions about biological diversity is that it's simply about numbers -- that it's better to have more and more individual plants and/or animals (even of just one kind). Many people do not understand that biodiversity is the unique group of organisms, and the interactions they have with each other and with their environment, that are important.

Please select the description of biodiversity that does the best job of clearing up this misconception.

CHOOSE ONE:

☐ Biodiversity is not just about counting how many plants and animals there are. It's about the complex web of plants and animals that an ecosystem supports, with each one relying upon many others.

☐ Biodiversity is not just about counting how many plants and animals there are. It's about the complex web of plants and animals that an ecosystem supports when it is healthy -- there may be lots of some kinds of species and a few of other kinds of species.

☐ Biodiversity is about more than counting how many plants and animals there are. It's about the complex mixture of plants and animals that a healthy landscape supports, that interact and that are interconnected.

COMMENT?

5. Some people have the idea that biodiversity is just for parks or some place else, but not where they live.

Please RANK THE FOLLOWING FOUR STATEMENTS on their ability to clear up this misperception by showing that having biodiversity all around us is important.

	FIRST	SECOND	THIRD	FOURTH
Most wildlife rely on plants to create homes or habitat, so supporting biological diversity can start with ensuring that we have native plants, whether in our backyards, industrial areas or fields.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We need to create homes for native plants and animals all around us -- in our cities, on our farmland, and in industrial developments. Otherwise, the little we have in parks will be like relegating all native plants and animals to exist in some open-air zoos.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We can create homes for native plants and animals all around us -- in our cities, on our farmland, and in industrial developments. If we don't support biological diversity all around us, the few we save will be those things that can live on little islands of habitat, a bit like saving those things that can survive in a jar or in a fishbowl.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We can create homes for native plants and animals all around us -- in our cities, on our farmland, and in industrial developments. Everywhere around us there are opportunities to allow and encourage native plants and wildlife.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

COMMENT?

6. There is a widely-held perception that if development occurs in one area, there's a lot of room for wildlife to move somewhere else. This is very often not the case.

Does the following statement correct this misperception?

	YES	NO
When we clear land for homes, fill in a wetland for a road, or plant a crop where native prairie used to be, the wildlife that relied on those areas can't just move to another spot. Those other spots, if there are any suitable ones, are usually already full, and if they aren't, it's usually because they aren't suitable for supporting that wildlife. Just like in our society, the good spots fill up first, and the substandard ones are left for last.	<input type="radio"/>	<input type="radio"/>

COMMENT?

7. If you are an agricultural producer, please skip ahead to the next question. Otherwise, continue here.

Some people feel that protecting biodiversity means conflict, giving something up, or that it is too costly. Does the following description alleviate this concern?

	YES	NO
When we make choices in our land use management that increase biodiversity, we also increase the resiliency and sustainability of our land and water so they can respond better to changes. This resiliency can give us cleaner water, more recreational opportunities, and healthier communities for people. We can encourage a healthier landscape with even small changes to our actions such as letting lakeshore plants grow in a previously mowed shoreline, reducing our use of water in our homes and yards, and planting native plants in our yards.	<input type="radio"/>	<input type="radio"/>

COMMENT?

8. Answer this question only if you are an agricultural producer. Otherwise, please skip ahead to the next question.

Some people feel that protecting biodiversity means conflict, giving something up, or that it is too costly. Please select the description that best alleviates this concern.

CHOOSE ONE:

☐ When we make choices in our land use or management that increase biodiversity, we increase the resiliency and sustainability of our land and water. We can encourage a healthier landscape with even small changes to our management such as using off-site waterers, moving salt away from water, or leaving stubble in a crop field.

☐ Pastureland with more litter or carryover is less likely to suffer winter kill, is better able to respond to drought, and provides a more stable and reliable forage supply -- in addition to providing habitat for wildlife and plants.

COMMENT?

4. TAKING RESPONSIBILITY AND TAKING ACTION

YOU'RE ALMOST DONE...

Just FOUR questions in this section...
please continue!

9. Many people agree that they play a big role in the health of the environment, but when asked about their personal impacts on the landscape, they often say they don't have a major impact themselves, regardless of where they live or what they do. This notion can be summarized as "My actions don't impact biodiversity... it's those other people and their activities".

Which of the following statements best explains that personal actions are important to, and do impact, biodiversity?

CHOOSE ONE:

☐ Everyone's actions can impact landscape integrity and biological diversity -- whether it's the demand for oil and gas development you create by driving your car or truck, buying a new home where native habitat was cleared, or contributing to the need for more landfill space with your kitchen garbage.

☐ Just as you can have a cumulative negative impact on biodiversity and landscape health, your actions can combine with others to positively impact landscape health, such as choosing to buy foods that support and encourage farmers to use sustainable practices, disposing of oil or used batteries safely to help protect water quality and fish habitat, or using fertilizers and herbicides only when needed and at recommended rates.

COMMENT?

10. We sometimes hear "Biodiversity isn't important to me -- I don't get any value from biodiversity".

This may be one reason why some people do not take actions that support biodiversity. Which of the following statements does the best job at explaining that biodiversity is important to us as individuals?

CHOOSE ONE:

☐ If you think biological diversity isn't important to you, think again. From 25% to 50% of prescription medications come from the rich natural world of plants, and we all rely upon insects to pollinate our crops so we have food to eat.

☐ Diverse plant and animal life contributes to the lives of all of us, even if we don't birdwatch, hunt, or fish, or even care about them -- we all eat food, require medicines, and need water to drink -- these are all things that a healthy landscape produces.

☐ Biodiversity is important to everyone. When we protect native species and habitats, we are also improving water, soil and air quality, reducing erosion, and increasing landscape health that we rely upon for food, water and livelihoods.

COMMENT?

11. 100% of those recently surveyed said that, as an individual, they play an important role in the health of both their watershed AND their local landscape. However, not everyone stated they take action or feel responsible for watershed health when making management decisions about their own places.

Please select the statement that is strongest in terms of motivating individuals to take action on their own places that supports biodiversity.

CHOOSE ONE:

☐ Because all individuals, urban and rural, play an important role in the health of our landscapes, your actions add up! Each action you take is a small piece of a large, cumulative puzzle. Each piece of the ecosystem that you take away or impact creates a hole or a gap, leaving a non-functioning landscape. Each piece of the puzzle that you support helps the puzzle show the image it is supposed to, to allow each interwoven ecosystem to function.

☐ Your actions make a difference to biological diversity! Each small way that you improve the health of the landscape, including reducing pollution and waste or increasing habitat, means there is that much more opportunity for native plants and animals to thrive.

COMMENT?

12. In thinking about the relationship between watershed health and the health of the environment on an individual's own place, please RANK THE FOLLOWING FOUR STATEMENTS for their ability to encourage individuals to be personally involved or to take action for a healthy environment.

	FIRST	SECOND	THIRD	FOURTH
Healthy watersheds = healthy people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Healthy landscapes = healthy people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Landscape health relies on you!	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Landscape health relies on your actions!	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

COMMENT?

5. FOR THOSE IN AGRICULTURE...

Please answer the questions in this section ONLY IF YOU ARE INVOLVED IN AGRICULTURE, i.e. as a farmer, rancher, producer and/or livestock owner.

If you are not involved in agriculture, please skip ahead to Section 6.

13. In a recent Cows and Fish survey, 88% indicated that potential negative impacts on water quality/quantity affected their management decisions in a big way.

Please RANK each of the following two statements in terms of its ability to motivate farmers and ranchers to take action that supports biodiversity.

	FIRST	SECOND
In our recent survey, almost 90% of farmers and ranchers reported that they consider impacts to water quality/quantity when making their management decisions, which benefits fish, amphibians and aquatic life that depend on clean and reliable water for a healthy aquatic ecosystem in which to survive. Are YOU part of this 90%?	<input type="radio"/>	<input type="radio"/>

Did you know that maintaining stubble through reduced tillage not only saves on fuel, and traps carbon and moisture, but that it also improves wildlife habitat and reduces erosion?

☐

☐

COMMENT?

14. Answer this question only if you are a LIVESTOCK producer or owner. Otherwise, please skip ahead to the next question.

Please select the statement that is strongest in terms of its ability to motivate a livestock producer to take actions on their own place that support biodiversity.

CHOOSE ONE:

☐ Did you know that using off-site watering systems improves water quality and cattle weight gains for you and downstream neighbours, but it can also benefit fish and wildlife that require streamside and shoreline habitats?

☐ Did you know that up to 75% of livestock producers in Alberta use off-site watering systems? Not only does this provide cleaner water to their livestock, improving herd health, but it benefits streambank and shoreline habitat for fish and wildlife, too?

☐ Using off-site watering systems improves water quality for livestock and neighbouring users, and also improves habitat for fish and wildlife alongside the waterbody.

COMMENT?

15. This question is only for those are are a LIVESTOCK producer or owner. If you don't have livestock, please skip ahead to the next question.

Riparian areas - those streambanks, floodplains and shore areas next to waterbodies - make up a very small part of the landscape, but they are often very important for forage production in pasture because of the abundant moisture available to plants. However, riparian areas can be particularly susceptible to trampling damage.

Please select the statement that is most likely to motivate a livestock producer/owner to take action related to riparian grazing in order to meet this need.

CHOOSE ONE:

☐ Careful timing of grazing in riparian pastures is needed because these areas are vulnerable to trampling when soils are moist.

☐ Because streambanks and shorelines can be trampled when soils are soft and moist, graze these areas to avoid these vulnerable periods.

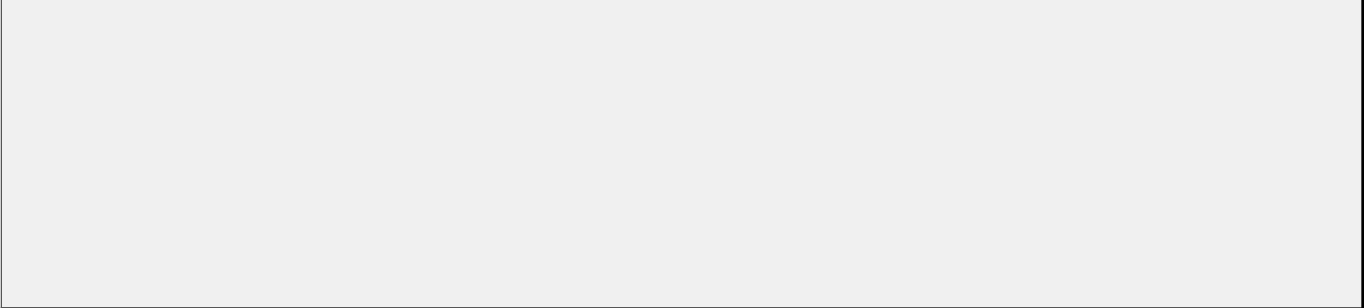
☐ Graze riparian areas next to streams, lakes and wetlands with care -- avoid them when soils are wet and soft to minimize hoof impact.

COMMENT?

6. ANY OTHER COMMENTS?

16. If you have any other ideas or suggestions that would guide Cows and Fish in communicating effectively about biodiversity, please share them here.

Thanks.



7. A LITTLE ABOUT YOU !

17. What municipality do you live in (e.g. Red Deer County, City of Edmonton, Town of Lac la Biche)?

18. Which of the following best describes your primary residence?

CHOOSE ONE:

- ☐ City, town or village home
- ☐ Country residential/acreage home
- ☐ Rural agricultural operation and home
- ☐ Other (please specify)

19. Which of the following categories best describes your primary occupation (current or retired)?

CHOOSE ONE:

- ☐ Farmer or rancher
- ☐ Natural resource management professional (e.g. agricultural or environmental)
- ☐ Professional Services
- ☐ Research and Education (including student)
- ☐ Resource Extraction (oil and gas; forestry; mining)
- ☐ Retail/Services
- ☐ Other Industry
- ☐ Other (please specify)

20. If you are an agricultural producer, please indicate which category best describes your operation. If you're not a producer, please skip ahead to the next question.

CHOOSE ONE:

- ☐ Primarily livestock
- ☐ Primarily cropping
- ☐ Mixed farming
- ☐ Specialty
- ☐ Other (please specify)

21. How much contact do you estimate you have had with the Cows and Fish program?

CHOOSE ONE:

- ☐ None
- ☐ Very little contact
- ☐ A moderate amount of contact
- ☐ A lot of frequent or in-depth contact

22. Did you attend any of these recent Cows and Fish events?

	YES	NO
SANDY BEACH Biodiversity Evaluation Workshop (January 14, 2008)?	<input type="radio"/>	<input type="radio"/>
ROCKYFORD Biodiversity Evaluation Workshop (January 29, 2008)?	<input type="radio"/>	<input type="radio"/>
MILLARVILLE Biodiversity Evaluation Workshop (January 30, 2008)?	<input type="radio"/>	<input type="radio"/>

8. YOU'RE DONE !!

THANK YOU !!

WE APPRECIATE YOUR KNOWLEDGE, TIME AND EFFORT.

This survey has been prepared, and will be analyzed independently on behalf of Cows and Fish, by IMI strategics, a public consultation company based in Edmonton.

If you have any questions about this survey or how its results will be used, please contact:

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Thank you on behalf of
COWS AND FISH
(Alberta Riparian Habitat Management Society)



APPENDIX E
EDITS TO USER'S GUIDE SUGGESTED BY PARTICIPANT



The following suggestions were made by one workshop participant to clarify some of the content of the User's Guide.

PAGE #	EDITORIAL SUGGESTION
1.	Should be "That's what measuring riparian health is about". Perhaps there is a better word than "measuring"; the rest of the sentence is not about riparian health, it's about learning to recognize riparian health and talking about it.
1.	May help our "management" (removed management) efforts.
2.	These parenthetic comments confuse rather than explain. There is plenty of time to expand later. First paragraph – take out (building habitat), (forage, shelter) (filtering and buffering water).
2.	Take out "or the total picture".
3.	I'm not sure that you can calibrate an observation. You calibrate an instrument. I'm not sure if I'm right – just a suspicion.
4.	Aren't all ecosystems characterized by "the interaction of water, soil and vegetation"?
4.	The list in the second sentence should be either all singular or all plural. No need to explain lentic and lotic if the words are not used later in the booklet.
5.	A % is not a size it is a proportion. "Despite making up a small portion of the landscape (2–5%) ..." is more correct; easier to read.
5.	"Border... edge" are the same thing – no need to use both words.
7.	How key (change to important – it is less ambiguous) ... riparian areas are.
7.	I believe that a machine is a poor metaphor for an ecosystem. If one cog is this watch is bent – the watch fails. In contrast, an ecosystem works because it has "give and play". An ecosystem can take a bit of abuse, that's what keeps it going.
8.	What do (insert) Healthy Riparian Areas Do?
12.	Move "sometimes" to after the "we sometimes fail".
13.	Paragraph 2 – line 2 represent and (change for to because of) concerns...
14.	Where We Were ... line 12 – add beavers also increased biodiversity
14.	Add – Native people also managed ecosystems for goals like food production. Their main tool was fire, but they also used transplantation, selective harvest and other tools.
16.	I think you should define "reach" here. After all, an assessment is generally done on a reach.
17.	"No weeds" should be changed to "Absence of weeds" to remove ambiguity.
17.	Second half of page – change in line 8 – change disturbance caused species ... to disturbance related species.
17.	Inhibit other, preferred plants (added comma)
18.	Line 3 – remove ... and key
20.	Second half of page ... second paragraph ... change disturbance caused to disturbance related. Add sentence ... Disturbance doesn't cause plant evolution causes plants.
22.	- A lowered water table that affects vegetation and the ability of the reach to support some types of vegetation. - Increased stream energy with more erosion sediment, and unstable banks. This ... - Last line – take out the word "values".
23.	2 nd paragraph – 1 st line – change depend to dependent 2 nd paragraph – 4 th line – taken out "and effects"
25.	1 st paragraph – line 3 – because no one (take out factor or) characteristic 1 st paragraph – line 4 – site health (take out or trend in health 1 st paragraph – line 8 – take out "which form and operate 2 nd paragraph – line 4 – take out "and potential"

PAGE #	EDITORIAL SUGGESTION
	3 rd paragraph – line 2 – much of the riparian area, take out “measured”
26.	1 st paragraph – line 8 – change caused to “related”
26.	1 st paragraph – line 9 - what are “management influences?”
27.	1 st paragraph – line 5 – remove “or modified”
28.	2 nd paragraph – line 3 – I don’t understand this sentence. What is a “break”? Also, you shouldn’t use the phrase “significant differences” when you have not done statistical tests.
28.	2 nd paragraph – line 9 – remove “the influence of relations to other characteristics and the significance of a characteristic to an ecological function or functions”.
29.	2 nd picture – top box, change few to “less”
36.	1 st paragraph – line 7 – surprised to find “that” what ...
36.	Bottom half of page – 2 nd paragraph – line 5 – change to “may result” in
40.	1 st paragraph – line 11 – change to “work can seem”