Social science and forestry curricula: Some survey results

by David B. Tindall¹

In this article, findings from a study of a forestry curriculum are used to identify current gaps and potential avenues of pedagogical contributions pertaining to social science content. In setting a context for this analysis a brief review of the potential contributions of social science to forestry, and a description of current social science research on forestry in B.C. and the surrounding region is provided. Survey results from: 1) stakeholders in forestry, 2) forestry undergraduate students, and 3) forestry faculty all point to the need for incorporating more social science content into forestry curricula. These survey results dovetail with observations about the need for more social science research on forestry topics.

Key words: social science, forestry curricula, intergroup differences, social survey research

Dans cet article, les résultats d'une étude d'un programme de foresterie sont utilisés pour identifier les lacunes actuelles et les directions possibles offertes par les contributions pédagogiques des sciences sociales en foresterie, et une description de la recherche actuelle en sciences sociales sur la foresterie en Colombie-Britannique et les régions immédiates est présentée. Les résultats du sondage provenant : 1) des intervenants en foresterie, 2) des étudiants au baccalauréat en foresterie, et 3) du personnel enseignant en foresterie indiquent tous la nécessité d'incorporer plus de sciences sociales dans les programmes de foresterie. Ces résultats du sondage rejoignent les observations faites sur la nécessité d'avoir plus de recherches en sciences sociales dans le cas des sujets touchant la foresterie.

Mots-clés : sciences sociales, programmes de foresterie, différences entre les groupes, recherche sur les sondages sociaux

Introduction: Social Science and Forestry

Until recently, beyond the discipline of economics, social science appeared to have little relevance for those in Canada concerned with forestry issues.² Patricia Marchak's groundbreaking book, *Green Gold*, published in 1983 helped to forge some connections between sociology and forestry. In recent years scholars concerned with forestry issues have become increasingly interested in what social science has to offer. This is partly due to a lack of confidence that has developed amongst substantial segments of the public in the "industrial/economic optimization paradigm" of forestry that has dominated for most of the past century. Current efforts to achieve a more "holistic forestry paradigm" have provided a window of opportunity for sociologists (and social scientists more generally) to build upon the contributions of Marchak and a few others.

In this article I will report on the results of an opinion survey about the relative importance of social science knowledge to the graduating professional forester. In order to provide a context for this I will briefly review the work of some other scholars on the potential and current contributions of social science to forestry.

In an earlier review article published in this journal, Beckley and Korber (1995) discussed sociology's past and potential future contributions to forestry. They noted that in the past, social science has made "only minor contributions to forest management and policy." Until recently, economics was the only social science discipline that received widespread attention by forest managers.

"In the 'old paradigm of forest management' ... economists helped forest managers determine the optimal combination of inputs and maximize financial benefits from a given parcel of forest land. They also assisted with market analyses, labour studies and other financial dimensions of forest management." (Beckley and Korber 1995: 712)

Beckley and Korber (1995) note that as a result of an emerging new paradigm in forestry, there now exists a window of opportunity for social scientists to make a contribution to forestry.

"The emerging forest management paradigm is focused on ecosystem health, the diverse human uses of forests, and long-term sustainability. Such a paradigm will necessarily need to draw on a wider base of scientific research to inform policy." (Beckley and Korber 1995: 712)

Beckley and Korber suggest that social scientists can make contributions by providing data and theoretical insights to forest managers and policy makers. They identify the following as areas in which sociology (in particular) can provide expertise: analyses of stakeholder values, social movements, conflict and its resolution, poverty in forestry-dependent regions, complex organizations, global restructuring, and community stability.

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²One of the anonymous referees brought to my attention that B.E. Fernow writing in the early part of the twentieth century expressed the opinion that social issues were relevant to forestry. However, his view was that such issues were a matter of common sense rather than of scientific investigation. This is a common attitude that social scientists are frequently exposed to. It is my experience that for any given phenomena, multiple contradictory "social science" explanations can be offered. While empirical investigation will usually prove only one of the explanations to be correct, all will be considered common sense.

Table 1. The relative importance of different areas of knowledge: mail questionnaire – whole sample (n=501). “Responses from the forestry public.”

Area of Knowledge	Percent of respondents choosing category							Mean ¹	Rank ¹	N ¹
	Very Important (1)	(2)	(3)	(4)	Unimportant (5)	Don't Know	No Response			
Humanities/Social Sciences										
Conservation ethics	35.5	34.1	24.6	2.2	1.0	1.0	1.6	1.96	1	488
Economics (micro/macro)	23.2	32.5	33.1	7.2	1.0	1.0	2.0	2.28	3	486
Indigenous peoples & Cultures	10.6	24.6	42.3	14.0	5.2	1.4	2.0	2.78	7	484
Interpersonal relations/ small group dynamics	29.9	35.5	23.2	7.8	1.6	0.4	1.6	2.14	2	491
Literature & composition	13.2	28.7	31.9	16.2	6.8	0.6	2.6	2.74	6	485
Politics/ government/ social structure	9.8	26.5	34.9	19.6	6.0	0.4	2.8	2.85	8	485
Resource community studies	17.2	34.5	30.5	9.6	3.0	2.4	2.8	2.44	5	475
Social impact assessment	19.0	31.9	31.7	11.0	1.8	1.4	3.2	2.42	4	478

¹Mean, Rank, and N (Number) are calculated from the cases for which the question response was 1, 2, 3, 4, or 5 (Very Important through Unimportant) and exclude all cases with the response “Don’t Know” or where there was no response.

forest managers and policy makers have begun to recognize the potential contributions of social scientists to forestry, a question remains about the perceived relevance of social science to forestry in the academy.

The Perceived Relevance of Social Science Knowledge to Forestry Curricula: Some Survey Results

Above, I have reviewed some trends and issues associated with social science research on forestry topics. I will now turn to consider the potential for pedagogical contributions to forestry by social scientists. I will review the results of three surveys I conducted with the “forestry public” (defined below), U.B.C. forestry faculty, and U.B.C. undergraduate forestry students regarding the knowledge and skills that they consider to be “important for the graduating professional forester.” Most relevant to the present article are the results for knowledge relating to social science. The surveys discussed here were sponsored by the University of British Columbia’s (U.B.C. hereafter) Faculty of Forestry, and the B.S.F. (Bachelor of Forestry) Review Task Force.⁴

Methods

A self-administered questionnaire was developed based on an earlier study undertaken by the U.B.C. Wood Science Department (Cohen and Maness 1995). The new survey instrument was pretested, and revised. The final version of the questionnaire (referred to below as “the mail questionnaire” or the “mail survey”) asked respondents to provide information on the relative importance of specific knowledge (e.g., “insects/diseases”) and skill items (e.g., “geographic information systems – basics”) from two comprehensive lists. People were also asked to evaluate the relative importance of various broad categories of knowledge (e.g., “Humanities/Social Sciences”) and skills (e.g., “Field Skills”). Finally, respondents were asked to provide information on the type of organization and sector of the economy they worked in, the type of position they held, their educational background, their familiarity with the UBC Forestry program, their age, and their sex.⁵

⁴A similar study was conducted in 1998 by the Pinchot Institute for Conservation. The institute surveyed forestry employers and recent graduates of forestry programs at U.S. colleges and universities (see Sample et al. 1999). The Pinchot Institute survey gave less emphasis to social science curricula in its survey, than did the U.B.C. survey discussed here.

⁵A copy of the questionnaire can be obtained by writing the author.

The Mail Questionnaire Sample

It was the intent of the mail survey study to obtain information from a relatively broad cross-section of people who are knowledgeable and concerned about forestry in B.C. In developing a sampling frame we utilized the mailing list of the B.C. Forestry Continuing Studies Network. We developed a stratified random sample. The following categories were used in stratifying the sampling frame: 1. Professional/Technical People, 2. Forest Management Workers, 3. Harvesting Workers, 4. Environmentalists/Naturalists, 5. Aboriginal Representatives. After eliminating duplicate names, individuals from each of these categories were selected into the sample. The selection procedure employed systematic sampling using a random start. The survey was administered in the spring of 1995. The final sampling frame consisted of 2493 people. We received 507 responses, yielding a response rate of 20.3%.⁶

Respondents were asked to judge what they believed is needed as core knowledge for a professional forester by rating a series of specific knowledge and skill areas. People were asked to rate the items on a scale of 1 (Very Important) to 5 (Unimportant). There were fifty-two specific *knowledge items* organized under the following seven broad categories: 1) Physical/Biological Sciences, 2) Humanities/Social Sciences, 3) Forest Sciences, 4) Forest Management, 5) Forest Operations, 6) Business/Organizational Management, 7) Public Policy. There were twenty-one skill items organized under the following five broad categories: 1) computer skills, 2) managerial skills, 3) communication skills, 4) field skills, 5) problem solving.

⁶This rate is identical to a survey by Cohen and Maness (1995), which was conducted for the purposes of reviewing the wood science program at U.B.C. While this figure is somewhat low by social science standards, it is a good response rate by “market research” standards. From a methodological viewpoint, it is interesting that the “Wood Science” survey and the “Forest Resources Management” survey obtained the same response rate. The “Wood Science” survey employed a non-random sampling procedure, the questionnaire was two pages long, and the survey design did not include a follow-up letter. The “Forest Resources Management” survey used a random-sampling procedure, the questionnaire was four pages long, and the survey design did include a follow-up letter. Thus the response rate of the latter survey was likely reduced somewhat by the length of the questionnaire (it being twice as long as the Wood Science survey questionnaire), but at the same time, the response rate was increased somewhat by the inclusion of a follow-up letter.

Table 2. The relative importance of different areas of knowledge: responses from U.B.C. forestry faculty and U.B.C. forestry students

Area of Knowledge	Faculty				Students			
	Now ¹	Ideal ¹	Gap Score ²	N ³	Now ¹	Ideal ¹	Gap Score ²	N ³
Humanities/ Social Sciences								
Conservation ethics	3.76	2.05	1.76*	17	3.56	2.12	1.44*	43
Economics (micro/macro)	2.31	2.14	0.38*	16	2.64	2.27	0.36*	44
Indigenous peoples & cultures	4.29	2.61	1.76*	17	4.05	2.12	1.98*	43
Interpersonal relations/small group dynamics	3.76	1.91	1.76*	17	3.60	1.72	1.86*	42
Literature and composition	3.72	2.43	1.28*	18	3.60	2.74	0.86*	42
Politics/Government/Social structure	3.80	2.36	1.53*	15	3.23	1.98	1.23*	43
Resource community studies	4.07	2.55	1.07*	14	3.80	2.44	1.33*	43
Social impact assessment	4.33	2.57	1.53*	15	3.83	2.30	1.55*	42

Notes:

¹The "Now" and "Ideal" scores are mean scores for the Importance Scale where 1 = "Very Important," and 5 = "Unimportant."

²The gap score is calculated by subtracting the "Ideal" score from the "Now" score. In some cases there are data only for the "Now" or "Ideal" (due to "Don't know" or "Missing" responses). Such cases are dropped when calculating the "gap score." This table provides all available data for the "Now" and "Ideal" scores (e.g., before cases have been dropped). Thus, the "gap" scores that are listed will sometimes differ from the result that is obtained by hand calculations using the data in the table.

³This is the N for the cases included to calculate the gap score.

*t-test is significant for "gap" (or difference) score, where $p \leq .05$.

Results: Mail Questionnaire

In this section I present the results for the Humanities and Social Sciences questionnaire items from the mail questionnaire (given to the "forestry public" – see Table 1). Of the eight areas listed under the category, *Humanities and Social Sciences*, only two are currently offered and/or required in the B.S.F. program at UBC; these are: "Economics (micro/macro)," and "Literature and Composition."

Five of the eight items listed were rated below the mid-point (e.g., closer to "Very Important" than "Unimportant"). Of these five, the following four items are not covered (at least as separate courses) in the current program: 1. "Conservation Ethics," 2. "Interpersonal Relations/Small Group Dynamics," 3. "Resource Community Studies," and 4. "Social Impact Assessment."

It should be noted that there were statistically significant inter-group differences in ratings for some of these areas (not shown in Table 1). For example, respondents from NGOs rated the "Indigenous Peoples and Cultures" area of knowledge as being more important ($\bar{x} = 2.2$), compared to respondents from the Private ($\bar{x} = 2.9$) and Public ($\bar{x} = 2.8$) Sectors. Also, younger people were significantly more likely to rate "Indigenous Peoples and Cultures" as being more important ($\bar{x} = 2.6$ for "under 35"; $\bar{x} = 2.7$ for "aged 35–44") compared with older people ($\bar{x} = 3.0$ for "aged 45–54"; $\bar{x} = 3.1$ for "aged 55 and older"). Further, women ($\bar{x} = 2.4$) were significantly more likely to rate the "Indigenous Peoples and Culture" item as being important, compared with men ($\bar{x} = 2.8$).⁷ As forestry faculty members tend to be a fairly homogeneous demographic group, these results suggest that more attention should be played to the perceived needs of subgroups whose values may differ from those of the average faculty member.⁸

⁷One of the anonymous referees noted that the categories used for the inter-group comparisons are different from those used for stratifying the sample. This approach is taken because information about these demographic categories was obtained via the questionnaire but was not available a priori. Thus it was not possible to construct a sampling frame based on the demographic categories. This approach does not present a problem for this part of analysis as the objective is to provide some comparisons between subgroups within the sample, but not to use these subgroups to construct parameter estimates for a larger population.

The Faculty/Student Questionnaire

A slightly altered version of the questionnaire used in the Mail Survey was administered to U.B.C. forestry faculty and students. All forestry faculty received a questionnaire in their mailbox (N=42). Questionnaires were returned from 21 faculty members, yielding a response rate of 50% for this component of the study. This questionnaire was also administered to students in a fourth year forestry course. Forty-four students completed the questionnaire (which represented a 100% response rate, based on those to whom it was administered). Results from these two surveys are presented in Table 2.

The most important difference between the Mail questionnaire and Faculty/Student questionnaire is that the latter asked respondents to rate both the "importance of different knowledge and skill items to the core knowledge of a professional forester," as well as the "importance given in the current professional forester program." The latter question allows the identification of gaps in the (perceived) emphasis given to particular areas of knowledge and skills in the current program, and the emphasis that ideally should be given.

Large positive "gap scores" suggest that knowledge areas and skills should be given more emphasis than they are currently given. Large negative scores suggest that they could be given less emphasis.

Results: Faculty

Results from faculty revealed that of the eight Humanities/Social Sciences "knowledge areas," seven had a "gap score" $\geq +1.0$. With the exception of "economics (micro/macro)," faculty perceived there to be large gaps between what is currently taught and what should be taught. All of these differences were statistically significant (see Table 2).

⁸For example, while the vast majority of forestry faculty members are men, the survey identified a number of statistically significant opinion differences between men and women. Also, while a cross-section of groups identified "Indigenous Peoples and Cultures" as a knowledge area of particular importance, at the time this study was undertaken – to my knowledge – there were no Forestry faculty members in Canada who were Aboriginal. Subsequent to the survey, Peggy Smith has been hired in the School of Forestry at Lakehead University.

Results: Students

Results from students revealed that six of the eight of the Humanities/Social Sciences "knowledge areas" had a "gap score" $\geq +1.0$ (the exceptions being "Economics" and "Literature and Composition"). Thus, student perceptions about large gaps between what is currently taught and what should be taught for the Humanities/Social science areas listed in the questionnaire largely paralleled those of faculty. All of these differences between what is currently taught and what ideally should be taught for the eight Humanities/Social science items were statistically significant (see Table 2).

Thus, for both academic samples there are no negative scores. All of the humanities and social science areas are perceived (to varying degrees) to require more emphasis in the program. As there are currently required courses only in economics and literature/composition, the fact that there are no negative scores is not too surprising.

Conclusions Regarding Quantitative Survey Results

Responses suggest that almost all of these areas of humanities/social science knowledge should be core knowledge for the graduating professional forester, and that most are not given adequate attention in the current UBC forestry program. These findings raised some questions for the UBC Faculty of Forestry to contemplate regarding the restructuring of its program. However, these findings also identify areas of pedagogical opportunity for sociologists and other social scientists.

Additional Qualitative Responses to the Mail Survey, the Faculty/Student Surveys

Respondents to both the Mail survey and the Faculty/Student survey were invited to provide additional written comments at the end of the questionnaires. An analysis of the handwritten comments produced a number of recurrent themes. Of these, three are of particular interest to the issues addressed in this article: "Multi-disciplinarity/Integrated knowledge/ Integrated Management," "Social Aspects of Forestry," and "First Nations."

Multi-disciplinarity/integrated knowledge/integrated management

A number of responses stressed the need for professional foresters to be "multi-disciplinary" in their approach, the importance of integrating different areas of knowledge, and the growing importance of integrated management. Typical responses include:

"I am graduating this year and I have three seasons of field experience and I am not very confident in my skills to be a forester in today's 'forest situation.' I feel unprepared to meet a lot of the challenges I think I'm going to encounter. ... There is still a feeling of 'timber' is the most important value in our courses. I think the demands that will be placed on us in the 'real world' require us to know more about other values (i.e., First Nations, conservation, etc.) Forest Resources Management isn't a very representative title for our program." (Student Survey Respondent)

"Foresters need to have broad appreciation of both the biophysical and social implications of their management

decisions. Foresters also need to develop the confidence and supporting fraternity to speak out against current management practices and policies they feel are detrimental to forest stewardship and long term social welfare." (Mail Survey Respondent)

"As my scrawled remarks indicate; foresters must learn to be better communicators and better at planning in a multi-stakeholder environment. The age of technical experts making decisions based on science and knowledge is past. The future is one of integrated resource management through consensus-based decision-making. Either that or the war in the woods escalates." (Mail Survey Respondent)

Social Aspects of Forestry

Comments that dealt with social aspects of forestry and social skills were moderately frequent. Typical responses include:

"... my impression is that it [the program] is strong on Conventional Timber Management – how to get to a desired age-mix, etc. My impression is also that, as with industrial workers, they know very little about why the politically-dominant, white-collar, urban culture feel as strongly as they do about 'forests' and are for that reason poorly equipped to deal with controversies. I do not think that the problem, or solution, lies in techniques of communication." (Mail Survey Respondent)

"... RPFs certainly need a solid base of relevant skills and background knowledge but as professionals, they need the higher order skills/abilities to analyze, synthesize, be sensitive to public issues and most important - be creative with solutions. ..." (Mail Survey Respondent)

"Professional foresters should be encouraged to have a well-balanced understanding of the humanities/social sciences. Proficiency in the 'knowledge' and 'skills' areas may not be satisfactory to deal with the complexities of future forest resource management." (Mail Survey Respondent)

First Nations

A number of respondents mentioned the importance to professional foresters of understanding First Nations' perspectives. Typical responses include:

"I'm very disenchanted ... with ...foresters who have been insensitive to myself and my existence as an aboriginal entity. Please hurry up and change your program to reflect our changing interrelationships. ..." (Mail Survey Respondent)

"Would like to see the Minister of Forests work more closely with Native people on Forestry, in the near future. [There is a need for] foresters sensitive to First Nations needs or more First Nation Foresters. ..." (Mail Survey Respondent)

Conclusion

In sum, responses from the three surveys indicated that knowledge associated with the humanities and social sciences (areas of knowledge listed in the questionnaire) were viewed as important, and should constitute core knowledge for the graduating professional forester. Further, most of these areas are

not currently part of the forestry curriculum at UBC. Of course, there is a question regarding the generalizability of these results. On purely statistical grounds, these results can not be generalized beyond the populations from which samples were drawn. On the other hand, it should be noted that the UBC Faculty of Forestry is one of the largest and most influential in North America. It provides training to a relatively high proportion of professional foresters in B.C. and Canada. While there are some variations in the curricula of different forestry schools and in the problems faced by professional foresters in different regions, it would be surprising if many of the observations made above were not applicable to other schools and regions.

The problem of interdisciplinarity was raised in both written responses to the questionnaires and by one of the anonymous referees of this article. Survey results suggest that interdisciplinary approaches need to be given more emphasis in forestry curricula. This is a topic worthy of article-length consideration, and I will only touch upon a couple of issues here.

When foresters, students, and others call for a more interdisciplinary approach they are often calling for the incorporation of social science knowledge into the solution of forestry problems. One solution often proposed by my colleagues is to offer upper level courses where "multiple values" and "multiple approaches" are integrated. I believe this is a worthy goal. However, a serious difficulty exists with this proposed solution – as the analysis of curriculum gaps suggests – because students do not have prior exposure to "social science basics." Thus, in upper level courses that attempt to integrate multiple values into planning and policy, students are being asked to integrate knowledge they have learned in biology, ecology, forest operations, forest measurement, etc. with social science knowledge – that they have not obtained during the course of their studies. In my opinion, more exposure to social science in earlier years of undergraduate programs is necessary for integration of values/approaches to successfully be achieved in upper level courses.

A second problem, is that much – if not most – interdisciplinary research is really multi-disciplinary research. In my experience, many interdisciplinary research projects are really multi-disciplinary in the sense that they bring researchers together from different disciplines to work on their own pet projects as part of a larger multi-disciplinary undertaking organized around a broad natural resource topic. Until researchers – especially academic researchers – are able to integrate different disciplinary approaches to work on integrated natural resource management problems it may be too much to ask students to do this. Then again, perhaps we could learn from our students' efforts in this regard.

In this article I have tried to document the perceived need for more social science content in forestry curricula. Of course, there are ever increasing demands on faculty and

students in terms of new material. While there was support from a cross-section of survey respondents for more emphasis on social science, this does not mean that less emphasis should be given to core natural science knowledge areas, or to the technical skills needed by professional foresters. The demand for a greater breadth of knowledge poses challenges to academics in revising and developing curricula. In face of increasing and competing demands there is sometimes an impulse to develop "simplifying and streamlining" strategies. Along these lines some critics have suggested that emphasis to "peripheral material" such as social science could be dropped or given token coverage in the curricula. I would suggest that these types of "solutions" should be resisted. In thinking about foresters – especially foresters of the future – there is a tendency to create an "ideal type" of the "operational forester." When we focus on such an ideal type, emphasis in forestry curricula is given primarily to technical skills. While I would again reiterate that technical competence is crucial many if not most forestry graduates will not end up as operational foresters. Forestry graduates are distributed among the private, public, and not-for profit sectors – nearly as many work for the public as the private sector. Many forestry graduates end up working in policy and communication positions, and many will become involved in public land planning processes at some point in their career. While social science curricula may also be valuable to operational foresters, it is necessary to the education of foresters in other roles who need to interact with the public, and who need to take public concerns, values, and opinions into consideration in helping to manage forest lands.

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References

- Beckley, T. and D. Korber. 1995.** Sociology's potential to improve forest management and inform forest policy. *For. Chron.* 71: 712–719.
- Bronson, E. 1996.** Summary Report. Society and Forestry: A Directory of Researchers in British Columbia and the U.S. Pacific Northwest. British Columbia Ministry of Forests Research Branch Victoria, B.C.
- Cohen, D.H. and T. Maness. 1995.** Educational Needs of the Canadian Solid Wood Products Industry. *Wood and Fiber Science* 27: 126–133.
- Marchak, M.P. 1983.** Green Gold: The Forest Industry in British Columbia. U.B.C. Press, Vancouver, B.C.
- Sample, V.A., P.C. Ringgold, N.E. Block and J.W. Giltmier. 1999.** Forestry Education: Adapting to the Changing Demands on Professionals. *J. For.* 97 (9): 4–10.