

Chapter 10

Maps and Surveys

Maps and map-related resources are an important part of any Indigenous research project. They contain valuable visual and textual information on the boundaries, location, and size of reserve allocations. They also provide evidence of traditional use and occupancy that may not be found elsewhere. For example, maps can provide proof of the existence of specific hunting or trapping areas, village sites, and graveyards and burial sites. If you are defending your community's history in a land rights claim, historical maps can help you document your case. Like oral testimony and archaeological materials, they include information that compliments documentary findings. They provide visual evidence that can help you defend your community's **Aboriginal Title**.

This chapter provides information on the basic maps and map-related resources that show the features and uses of your community's lands. It also points out where these resources can be found.

If you are interested in doing more than documentary research and you would like to conduct a cultural mapping project, see the UBCIC-Ecotrust Canada publication, *Chief Kerry's Moose: A Guidebook to Land Use and Occupancy Mapping, Research Design, and Data Collection* (2000) by Terry Tobias. *Chief Kerry's Moose* describes how to collect and map traditional land use information to defend Aboriginal Title and Rights. It is available on-line at: <http://www.nativemaps.org/chiefkerrymoose>. There are hardcopies of this publication at the UBCIC Resource Centre.

Historical Maps and Map-Related Documents

Unless noted, see Chapter 3: Resource Institutions for contact information for the institutions listed in this chapter. See Chapter 4: Documents for more information on the documents themselves.

Hudson's Bay Company (HBC) Maps

The HBC Archives has the largest collection of fur trade period maps in North America. The collection holds nearly 12,000 maps, charts, and plans, dating from 1563 to 1982, including 1,641 pre-1870 maps and 15 pre-1870 atlases. These maps contain a wealth of information on early trade routes, villages, trails and traditional use sites.

Many of the HBC Archives' maps are on microfilm. You can obtain these through **inter-library loan**.

Royal Engineers' Maps and Surveys

The Royal Engineers (RE) were sent from England to help prepare the colony for non-Indigenous settlement in the 1850s. Their tasks included carrying out the earliest formal land surveys in BC, which took place between 1853 and 1863. They explored and mapped the territory, surveyed lands, and set up a comprehensive land survey and registry system for all lands, including Indian reserves. The locations of the various RE work parties and survey crews were regularly published in the government gazettes of Vancouver Island and colonial British Columbia. If the RE were active in your area, you can use their maps, survey field notes and correspondence to find information on:

- Indigenous village sites, burial grounds, camping places, fishing stations, trails, cultivated places, and other important sites.
- The size, shape and location of specific land parcels (including reserves)
- Higher-level government decisions on specific reserves, including whether an Indian reserve was formally approved (or rejected), by whom and on what date, and whether cut-offs or additions to the land base were made.
- Whether Indigenous people welcomed or dismissed reserve allotments at the time they were made.

Original plans of Royal Engineers' surveys are available at the BC Surveyor General Map Vault. You can obtain microfilmed copies of some of these at the UBCIC Resource Centre and the BC Archives. You may find field notes and other related documents for pre-confederation Indian reserves in the BC Archives Colonial Correspondence files. These are filed under the names of RE surveyors, civilian surveyors, officials in the Lands and Works department and others. Some **field notes** are located in the "Royal Engineers" drawers at the Map Vault at the Surveyor General Branch. Others are in a separate section of the Vault specifically devoted to field notes. The field notes produced during a survey often contain valuable information that does not appear on the map or plan. You may also need to consult the Joint/Indian Reserve Commission records (discussed in following section) for evidence of Douglas reserves. Often the resurveys of the reserves that took place in the post-confederation period will provide more information than the original surveys.

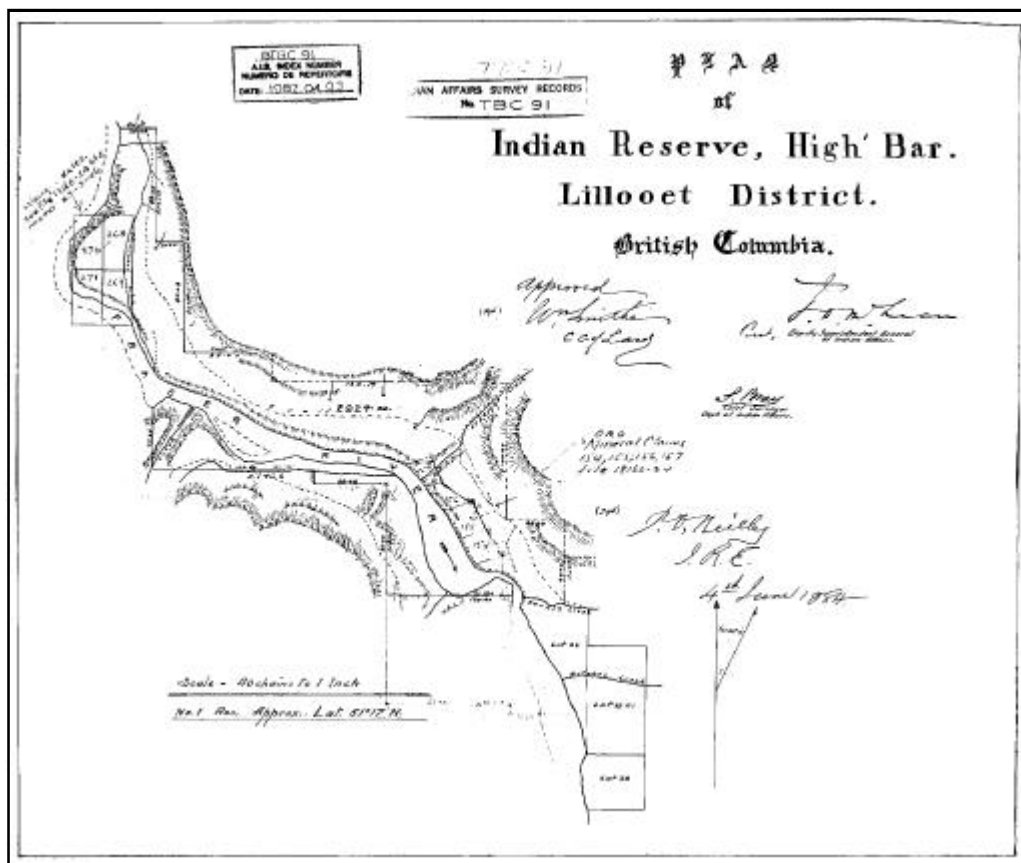
See Chapter 15: Pre-Confederation Reserves for more information on colonial land surveys. See also *Papers Connected with the Indian Land Question*, (Victoria: Queen's Printer, 1875) for background information on colonial government policy and the surveying of Indian reserves.

Royal Navy Hydrographic Maps

Hydrographic maps document coastal waterways. (They are sometimes called marine charts.) They include information on the shape of the coastline, water depth, currents, anchorages, hazards to navigation and the location of landmarks and communities along the coast and up the Fraser River. In BC, hydrographic maps were produced by the Royal Navy. The BC Archives has original hydrographic maps in their map collection. See the entry on BC Archives in this chapter for details on gaining access to maps in their research collections. You can also get copies of the maps at the BC Surveyor General Branch.

Joint / Indian Reserve Commission (J/IRC) Surveys

J/IRC surveys are maps outlining of the location, boundaries and acreage of Indian reserves. They were created using the information produced by the Joint Indian Reserve Commission (1876-1878) and the Indian Reserve Commission (1878-1910) in their **Minutes of Decision** (MOD).



Survey Plan
(Tracing) of High
Bar Indian
Reserve No.1.¹

Royal Commission on Indian Affairs for the Province of BC (McKenna- McBride Commission), 1913-1916, Minutes of Proceedings and Agency Maps

Among the many documents produced by the Commission, the Minutes of Proceedings the Agency Maps will be the most useful. They record evidence about the use and quality of reserve lands.

Indian Reserve Survey Records

The federal and provincial governments have surveyed many reserves in BC several times since the original allotments. The records produced in the process include information

on changes to original allotments, such as cut-offs or environmental changes. The records take many different forms, including:

- Survey plans. These are maps of the surveyed places, drawn true to scale, to shape and direction. They show length and direction of boundaries, important features such as trails, and enough information to allow officials to identify the specific piece of land. They are generated from the information contained in the survey field notes.
- Field notes. Field notes are the records of what the surveyor encountered on the ground as he actually marked out and measured the boundaries set out in his instructions. Sometimes there may be more than one set of field notes, and they may not always be the same. See the discussion of analyzing field notes later in this chapter.
- Map tracings. Tracings of survey plans are made by a drafting professional. These are usually much clearer than the pencil and pastel originals and they may show developments that have occurred since the original survey, such as road or hydro rights-of-way. It is useful to compare map tracings to the official plan because they are usually much cleaner and easier to read and photocopy, but remember they are not the official or legal reserve plan. Tracings are identified by the designation “TBC” followed by a number, while official reserve plans started with “BC” followed by a number. So, for example, a record titled BC469 would be the official plan, while TBC469 and TBC471 would be the tracings.

A comprehensive collection of surveys, notes, maps and plans of all Indian reserves in Canada is maintained by the Legal Surveys Division of Natural Resources Canada (NRCan). Library and Archives Canada (LAC) also maintains a collection of maps of Indian reserves of western Canada. Note that while these sources are available on the NRCan website it is always best to work with hard rather than digital copies because some information may be hard to see on digital versions.

Also, look for additional information about reserve surveys, as survey records never tell the whole story. Some examples of additional survey-related documents you will want to study include:

- Letters between the Indian Reserve Commissioner, the BC Indian Superintendent and the Department of Indian Affairs in Ottawa. These may be archived, or microfilmed as part of LAC’s **RG 10** (Record Group 10), or they may still be active departmental headquarters or regional files that must be requested through Indian and Northern Affairs Canada (INAC). You may also find correspondence between the surveyor and the Canadian Surveyor General, but only during the 1900s.
- Survey Reports or Surveyor’s Diaries. Some surveyors kept diaries or wrote reports. These may be included in a field book or they might be incorporated into an Indian Affairs or provincial Department of Lands & Works Annual Report. They could also be included in RG 10.
- INAC’s Survey and Reserve (SSR) files: These may be archived, or microfilmed as part of the RG 10 Black Series, or still active departmental

headquarters or regional files that must be accessed through the local INAC office. You can also check with the Legal Surveys Division of NRCAN to see if they have a reserve file that you can consult.

Other Historical Map-Related Documents

The following map-related documents will be particularly useful:

- BC Land District Registers
- BC Lands Files at the BC Archives and the BC Surveyor General Branch
- Crown Grants
- Land Title records
- Pre-emption records

Maps at the BC Archives

The BC Archives in Victoria is the best source of archival maps for Indigenous lands in the province. They have a variety of different types of maps, including plans, charts, and drawings.

There are two cartographic card catalogues that you need to consult if you are visiting the Archives in person. The cartographic catalogue is online and can be browsed from the BC Archives homepage. If you have access to the Internet you can do a lot of work before you leave home or even order map copies without even traveling to Victoria (if you have an account with BC Archives). If you are ordering records always be careful to specify what format you prefer for your map copies. If you do not, you may receive an oversized and extremely expensive photograph when a regular photocopy or fiche would have been much cheaper and served your purposes better.

It is possible to view some historic cartographic records at BC Archives in digital format if you have Internet access. These include some admiralty (coastline) charts, National Topographic System (NTS) Indexes, miscellaneous BC Lands districts, **pre-emption** maps (showing alienated parcels within a Land Recording District), land status maps, and mineral reference maps. The catalogue description for these records will indicate if the files are available in digital form on the Internet.

Maps in The National Map Collection

This is a collection maintained by LAC of about 40,000 maps and map-related documents on various historical issues. The collection includes extensive Railway Belt and forestry-related maps, such as those included in the Boyd Collection.

The map catalogue is accessible online. Check the list of resources on ArchiviaNet, LAC's online research tool. About 4,000 of the images have been digitized and are available on the site.



Contemporary Maps

Air Photos

The federal and provincial governments have taken air photos covering many parts of the province since the 1930s. These photographs show a view of the land from the air. They can be helpful for any type of research project where you are examining changes to the landscape, such as road construction, urban development, logging, or erosion. It is a good idea to find the photo for the time period you are studying, then view all the photos that were taken up until that time to track any changes to the landscape.

You will need to choose the appropriate type of air photo for your project. Black and white air photos will work fine for many projects. Colour photos are slightly more expensive but they can be helpful for projects that require you to identify information about the type of ground cover, such as forests, moose pasture, or grasslands.

If you are looking for air photos of an Indian reserve you can contact Public Works and Government Services in the Vancouver office of INAC. The photos are available to view but they cannot be copied.

There are a number of resources to consult for air photos of non-reserve lands in your traditional territory:

- LandData BC has indices of air photos from 1993 to 2001 (<http://www.landdata.gov.bc.ca>). You can log onto their website as a guest and request copies of the indexes. For further information see the guide to finding air photos at LandData BC at: http://srmwww.gov.bc.ca/bmgs/catalog/ldbc_air_photo_indexes.pdf.
- The National Air Photo Library of Natural Resources Canada (http://airphotos.nrcan.gc.ca/index_e.php). By registering as a user on this site you can find information for millions of air photos and order specific documents.
- The Geographic Information Centre (GIC) at the University of British Columbia Geography Department (http://www.geog.ubc.ca/resources/gic/air_photo.html).
- The Provincial Air Photo Library in Victoria (<http://srmwww.gov.bc.ca/bmgs/airphoto>).

Agricultural Land Reserve Maps

The Agricultural Land Reserve (ALR) is a provincially designated zone in which agriculture is the priority activity. The Provincial Agricultural Land Commission regulates the ALR.

Large-scale ALR maps are available for several regions within BC. These maps show rights-of-way, easements, lot boundaries, and other physical features. ALR maps can be useful in the early stages of a land research project because they provide a comprehensive overview of the land in a given area.

For more information or to find maps for your study area, visit the Agricultural Land Commission website: <http://www.alc.gov.bc.ca>. The Commission does not provide ALR maps but can direct you to the appropriate agency.

Topographical Maps

Topographical maps show natural surface features (lakes, rivers, streams, mountains, valleys and slopes), place names, water feature names, and highway names. They often also identify many cultural (human-made) features such as roads, buildings, boundaries, railroads and power transmission lines. Topographical maps can be very useful if you are researching changes or alterations in a landscape or plotting locations such as traditional use sites or travel routes.

Scale is an important factor in choosing or using topographical maps. Scale is the ratio of a distance on the map to the actual distance on the ground. A small-scale map shows a lot of territory, but not in much detail (a 1:250,000 scale map sheet covers about 17,000 square kilometres). A large-scale map shows a small area in great detail (a 1:50,000 scale map sheet covers about 900 square kilometres).

The federal government produces maps under the National Topographic System (NTS), in which all of Canada is divided into quadrangles measuring four degrees latitude by eight degrees longitude. The NTS map sheet reference for your area is available online at the Natural Resources Canada website: <http://maps.nrcan.gc.ca/search/mapsearch.html>. You can also gain access to these at the Geographic Information Centre (GIC) at the UBC Department of Geography or the geography departments at Simon Fraser University and the University of Northern BC. They may also be available at larger municipal libraries, such as the Vancouver Public Library.

The British Columbia government produces maps using its own system called the “British Columbia Geographic System.” For information on this system and how it relates to the NTS system see the “Mapping System” website of the BC Ministry of Forests: <http://www.for.gov.bc.ca/dfn/bcgs.htm>.

You can obtain topographical maps through the Topographical Maps division of Natural Resources Canada. See their website at <http://maps.nrcan.gc.ca/topographic.html> for more information. The Geological Survey of Canada, specialty map supply retail outlets, and major university map libraries also have topographical maps. If you do not have access to the repositories in the larger cities, local BC government agent offices are good sources. Topographical maps have also recently become available on CD. These digital maps are convenient but they are also costly. For more information on digitized topographical maps visit: <http://www.etopo.com>.

Thematic Maps

Thematic maps show information on specific features such as roads, water resources, traditional use areas, forest cover, mineral claims, geology, or recreational sites. You can obtain thematic maps from certain provincial government offices such as archaeological site maps from the BC Archaeology Branch; forest cover maps from the Ministry of Forests; road or highway plans from the Ministry of Transportation and Highways; and water use maps from the Water Management Branch. A wide range of individuals and private companies have also produced thematic maps. Your community may also have produced its own thematic maps for its own purposes.

A selection of thematic and other maps appears in the excellent volume edited by Keith Thor Carlson, *Sto:lo Coast Salish Historical Atlas* (Vancouver: Douglas & McIntyre, 2001).

Interpreting and Analyzing Maps

Maps and map-related resources are distinct from other types of documentary evidence you will encounter in your research. Finding the information you need from these resources requires some general knowledge about how maps work. This section outlines some important context information to help you. It discusses two stages of the research process: performing background research on your topic and interpreting maps and field notes.

Background Research



It can be helpful to get a recent map and use it as a working copy that you can mark with notes.

It is helpful to obtain a copy of a recent map that shows the area that you are going to research before you begin. You can use this as a working copy that you can mark with notes on the information you gather in your research. You may want to use a piece of acetate overlay and a variety of different coloured pens to identify the different types of information if your research issue is complex.

Start your research by exploring resources in your community. Check to see if anyone

has collected maps or map-related resources in the past, or has knowledge of past surveying or mapping projects. If your community has a museum, band archive, or lands management department or office that deals with resource use in your territory, they will likely have copies of useful maps and resources. Check to see what resources they have and if there is anyone who knows about interpreting maps and map-related documents. They may have valuable information to share or they may be able to advise you where you can find this information.

Next, try to develop a basic overview of the history and status of the land you are studying. For example, if you are concerned about the history of a particular parcel or area, you need to be aware of the jurisdictions (colonial, provincial, or federal) under which it has existed at different times. Each one of these governments may have created records that will be of interest to you. Some examples are listed below. For additional information on the documents listed here see Chapter 4: Documents. See Chapter 3: Resource Institutions for contact information.

- **Colonial Records:** If you are researching a colonial government land grant or policy you will have to check colonial records at the BC Archives. See Chapter 15: Pre-Confederation Reserves for more information on researching the colonial period.
- **Provincial Records:** If you are investigating land that is (or was) Crown land after Confederation, you will want to consult provincial government records at the BC Archives and BC Lands files at the Surveyor General Branch. You may also want to obtain records from government ministries. The main sources would be the old land status maps that the provincial

- government used to keep track of alienations. These maps showed names and file numbers for pre-emptions. You can also check for records at the BC Land Title Office.
- Federal Records: If the lands you are studying are federal (Indian reserve, national park, or military reserve) you will have to check various federal record groups See Chapter 5: Basic Reserve Research for more information on conducting this type of research.
 - Check the nine-volume *Catalogue of Maps, Plans & Aerial Photographs on Indian Lands in BC* at Lands & Trusts Services at the INAC BC Regional office.
 - If the land you are interested in falls within the Railway Belt or Peace River Block, you may need to consult both federal and provincial maps, as these areas were administered by the federal Department of the Interior between the 1870s and 1930s and by the Province after that. If the land has been alienated and is now privately owned, you will have to research historic land transactions between individuals. See Chapter 17: Surrenders for more information on researching reserve lands that were surrendered or cancelled.

Interpretation and Analysis of Maps and Plans

It can be difficult to interpret information on maps and map-related resources. Often there are specific codes and abbreviations that are not explained, or unfamiliar units of measurement that are used. Take note of all the features of a map and analyze the data you have assembled. Key information to record includes:

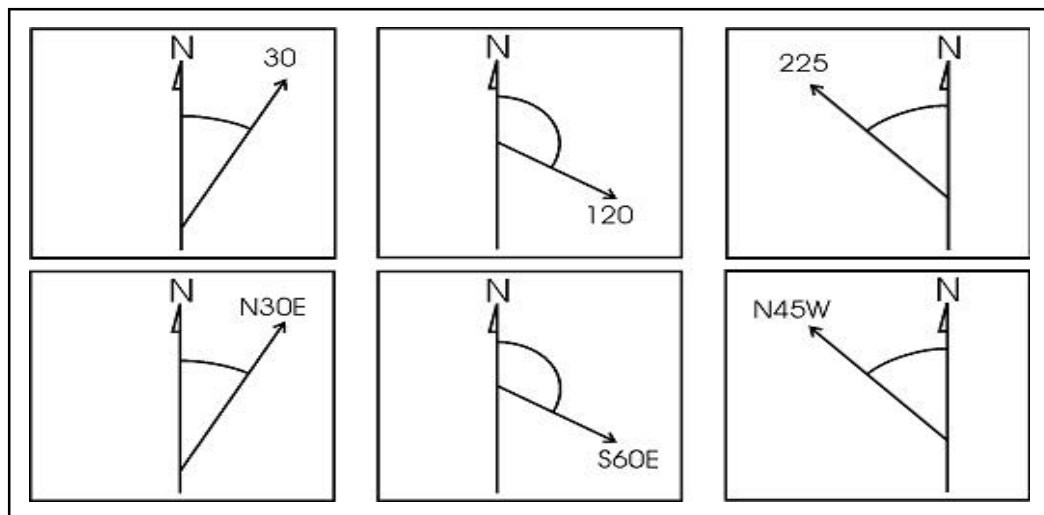
- Place Names. In many cases, Indigenous place names are spelled phonetically or incorrectly. In other cases, names may have been replaced by explorer, settler or missionary names. Similarly, spellings of place names change over time. Make a list of all of the variations on names and then keep your lists with you as you work.
- Dates. Sometimes it is hard to find accurate dates on historic maps. You will have to determine if the date shown refers to the date the mapping information was gathered, the date the map was published or the date the survey and/or reserve allotment was approved.
- Systems of Measurement. When you look at original maps and map-related documents, you will notice that different units of measurement have been used over time. It is useful to have a conversion chart available if you are working with a lot of maps. The following is a general introduction to commonly used systems of measurement:
 - Area: Surveyors until recently used the “acre” as the unit for measuring land area. Worldwide, there are approximately 40 different definitions of how much land is in an acre. In the British system the current definition was established by order in council in the 18th century. An acre covers exactly 43,560 square feet, or 640 acres to the square mile. A square mile may sometimes also be called a “section.”

- o Distance: Until the 1950s surveyors used a device called a Gunter’s chain, or “chain,” to measure distance. Some government ministries such as the Ministry of Forests used this system until the late 1960s when Canada converted to the metric system. The chain is 22 yards or 66 feet long, or 80 chains to the mile. It is divided into 100 “links,” each link being 7.62 inches. The device was also used to measure area. While the system may sound complicated, it was easy to use in practice.

The system works like this: 10 square chains or 10,000 square links equals one acre. That is, a plot 10 chains long and one chain wide is 10 square chains, or 1 acre. Similarly, 5 chains by 2 chains is also an acre; and 10 chains by 4 chains is 4 acres. The rule is: multiply length (in chains) by width (in chains) and divide by 10 to get your acres. 80 chains by 80 chains (1 square mile) equals 6400 square chains, or 640 acres. The same rule applies if you are combining chains and links in your measurement. Just use the number of links as a decimal place after the number of links. For example, a plot of land 20 chains plus 45 links long is 20.45 chains in length. If the plot is 5 chains wide, the size is $5 \times 20.45 = 102.25$ square chains, or 10.225 acres.

Distances on maps are measured horizontally, and not necessarily along the surface of the ground. A surveyor could encounter a steep cliff 100 feet high. But the distance from the top of the cliff to the bottom might only be a few feet as shown horizontally. On an ordinary map, only the horizontal distance would be shown. To compensate surveyors used what are called “correction tables” to convert on the ground measurements to a horizontal or flat measurement. It is very important to know the scale of the map you are using in order to ensure you get the correct interpretation of the information you are studying.

- o Direction: There are two main methods to indicate direction in surveys under the scientific (Cartesian) system. The most common modern method is to find North, then measure clockwise from



Comparison between the 360-degree “azimuth” directional system (top) and the north-south axis system.

North to the angle in question. This is the azimuth direction. The second main method is to measure the angle that the directional arrow makes with the north-south axis. The technique is to first name the direction (i.e. north or south) that is closest to the directional arrow, and then state the angle (east or west) by which the directional arrow points away from the North-South line.

- Potential errors: As with all historical documents, you will have to look out for potential errors in map documents. You may find inaccuracies that are the result of a variety of factors, including:
 - Misinterpretation of specific features in the land or confusion over distances.
 - Instrument errors, mistakes in recording data, failure to perform the survey as instructed, or even surveys of the wrong ground. During some periods in BC there were shortages of qualified or competent surveyors, which could lead to delays, or errors in the survey.
 - The process of converting survey notes into maps. Many errors came from the improper identification of the Point of Commencement (PoC). This was the official location of where a survey started. In setting the legal description, the PoC was located then a legal description was written, which is known as a “Metes and Bounds” description.

To guard against reproducing these and other inaccuracies try to obtain as many sources as possible and compare them to see if they support (or contradict) each other. Always study any instructions, sketch maps, field notes, official survey plans and associated documents very carefully to check whether they are consistent with each other.



Surveyors at work, Taku Lake, c.1912. (BC Archives 95681)

Field notes

It is helpful to understand the process of land surveying in BC in order to extract the important information from surveyors' field notes. One of the most important features to note is that surveyors normally conceive of land in terms of straight lines of measured distance and direction from a known starting point that was called the Point of Commencement (see above). The starting point and end point are survey "stations." In most cases, stations are the points at which the surveyor's path changes direction. Each straight line from the station is a "leg" of the survey. True-to-scale and true-to-direction representations of those legs may be drawn as lines on paper, and linked end to end, in sequence, to represent the surveyor's line of travel. In the end, this creates a line drawing of the surveyed parcel.



A portion of a page of field notes by the Royal Engineers.²

Also, field notes are usually written (and read) from the bottom of the page to the top. The reason for this is that everything that is to the left of the line of travel is on the left of the page and the features to the right are represented on the right side. When reading a surveyor's field notes, it may help you to imagine the surveyor shrunk to a very small size, walking along a centre line drawn on the page, and stepping to the right or left of centre in order to draw symbols to represent what he sees. The distances to the left or right of the survey line are also known as offset distances.

Notes

¹ Jemmet, W.S. "Indian Reserve, High Bar. Lillooet District, British Columbia." [Plan BTBC91 CSLR BC. Canada Lands Survey System. Ottawa: Natural Resources Canada.

² Portion of page 1 from "Royal Engineers, vol.28A." British Columbia Surveyor General Map Vault, Row 18, Cabinet 4, Drawer 3 (n.d.).

Resources

Akrigg, G.P.V. and Helen Akrigg. 1997. *British Columbia Place Names*. Vancouver: UBC Press.

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Cail, R. E. 1974. *Land, Man and the Law: The Disposal of Crown Land in British Columbia, 1871-1913*. Vancouver: UBC Press.

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Ruggles, Richard I. 1991. *A Country So Interesting: The Hudson's Bay Company and Two Centuries of Mapping 1670-1870*. Montreal: McGill-Queen's University Press.

Surveyor General Branch, Ministry of Environment, Lands & Parks. 1994. *Descriptions of Land*. Victoria: Queens Printer.

Websites

Aboriginal Mapping Network
<http://www.nativemaps.org>

BC Online Cadastre
<http://srmwww.gov.bc.ca/sgb/IMF/index.html>

BC Ministry of Energy and Mines Map Place
<http://www.em.gov.bc.ca/Mining/Geosurv/MapPlace>

Crown Land Registry
<http://srmwww.gov.bc.ca/clrs>

Land Data BC
<http://www.landdata.gov.bc.ca>

BC Geographical Names Information System
<http://srmwww.gov.bc.ca/bcnames>

Canadian Geographic Names Database
http://www.geonames.nrcan.gc.ca/index_e.php

BC Government website for Management of Survey Control Operations and Tasks (MASCOT)
<http://mascot.gdbc.gov.bc.ca/mascot>

Natural Resources Canada Map Based Plan Search page
<http://www.wroc.nrcan.gc.ca>

NRCan Gazetteer Map Service
<http://atlas.gc.ca/site/english/dataservices/gazetteer.html>

BC Geographical Names Gazetteer
<http://srmwww.gov.bc.ca/bcnames/gaz.html>

Inforain Map Archive (Ecotrust)
<http://www.inforain.org/maparchive>

