

Resource Management FACTSHEET

AGRICULTURE GIS ◆ Watercourse Classification ◆

Watercourse classification in agricultural areas is useful for many local government planning initiatives and also is required for two initiatives spearheaded by the Partnership Committee on Agriculture and the Environment. The Agricultural Watercourse Maintenance Guide and the Riparian Self Audit Handbooks for Beef, Dairy and Horticultural producers use an agriculture watercourse classification system. The Agricultural Watercourse Maintenance Guide uses the classifications to determine agency requirements for contact when doing work in and about watercourses. The classification system is used in the riparian audit to develop watercourse protection measures for channels in agricultural areas.

The classification system uses the physical and hydrological parameters of the watercourse. The classification system has three main categories: constructed ditches, channelized streams and natural streams. In addition to the watercourse physical parameters the presence or absence of fish should also be determined.

The intent of this information is to provide an overview of the classification system that should be used for agricultural areas.

Watercourse Classification

The physical and hydrological parameters of a watercourses in agricultural areas can be described by the following three categories.

Constructed Ditches

Constructed ditches have no headwaters, carry water from local surface areas or subsurface drains and may be permanently or intermittently wetted. These ditches have been primarily constructed for the purpose of removing excess water from farmland in order to improve crop production and farm viability. During summer months these channels may also be a source of irrigation water for farmland. Two or more constructed ditches may drain into a collector ditch. The collector ditch is considered a constructed ditch as long as it only drains other constructed ditches.

Constructed ditches are not identified under the *Water Act* but are covered by the federal *Fisheries Act* if fish depend directly or indirectly on them in order to carry out their life processes.

Constructed ditches include:

Dry Ditches – A dry ditch is defined as having a dry bottom. These channels are dry for the summer and early fall period and primarily were constructed to manage winter storm events. They do not usually have aquatic vegetation growth. Ditches that are normally dry but which temporarily impound water for irrigation with a control structure can be considered as dry ditches.



Wet Ditches – These ditches are wet all year round and carry water for drainage and irrigation purposes. If a constructed ditch should intercept a groundwater source (e.g. spring) then special circumstances may apply and the wet ditch could be considered a stream.

Groundwater sources provide constant cool water temperatures that will act as a refuge for salmonids during periods of high water temperatures.

STREAMS

Streams include all watercourses that are not classified as a constructed ditch. Streams can be categorized as either channelized or natural. The *Water Act* and *Fisheries Act* does not differentiate between channelized or natural streams with respect to licencing, legislative or regulatory requirements for conducting works in and around a stream. However habitat values for some channelized streams may be different than for a natural streams.

Channelized or Relocated Streams

Channelized streams are permanent or relocated streams that have been diverted, dredged, straightened and/or dyked.

Channelized and relocated streams can be characterized by the following:

- ◆ have headwaters and may transport water from a spring or natural wet area;
- ◆ are an integral part of the natural drainage and may have good fish habitat;
- ◆ are likely to have aquatic vegetation growth and support aquatic invertebrates;



Channelized or Relocated Streams

- ◆ are identified under the *Water Act* of B.C.;
- ◆ display straight channels which may show signs of natural channel processes (e.g. meandering, pool and riffle development) if left undisturbed for a number of years; and,
- ◆ typically flow along property or field boundaries.

Streams that have been channelized or relocated many years ago may look and perform like a natural stream and should possibly be treated as such.

Natural Streams

These are historic watercourses that have not been altered or have not recently been altered. Natural streams are covered under the *Water Act* and the *Fisheries Act*. Natural streams have the following characteristics:

- ◆ meandering channel or thalweg;
- ◆ riparian vegetative cover;
- ◆ instream submergent and emergent aquatic vegetation;
- ◆ pool and/or riffle habitat;
- ◆ variations in channel bed morphology e.g. organic materials, sands, gravels, or combinations thereof;
- ◆ evidence of water flow at some time of the year;
- ◆ are identified under the B.C. Water Act;
- ◆ limited evidence of channelling, relocation or other manipulation of the watercourse; and,
- ◆ support aquatic invertebrates.



Natural Streams

Figure 1 graphically illustrates the relationship between the various types of watercourses. Constructed ditches often flow into channelized and natural streams, not the other way around.

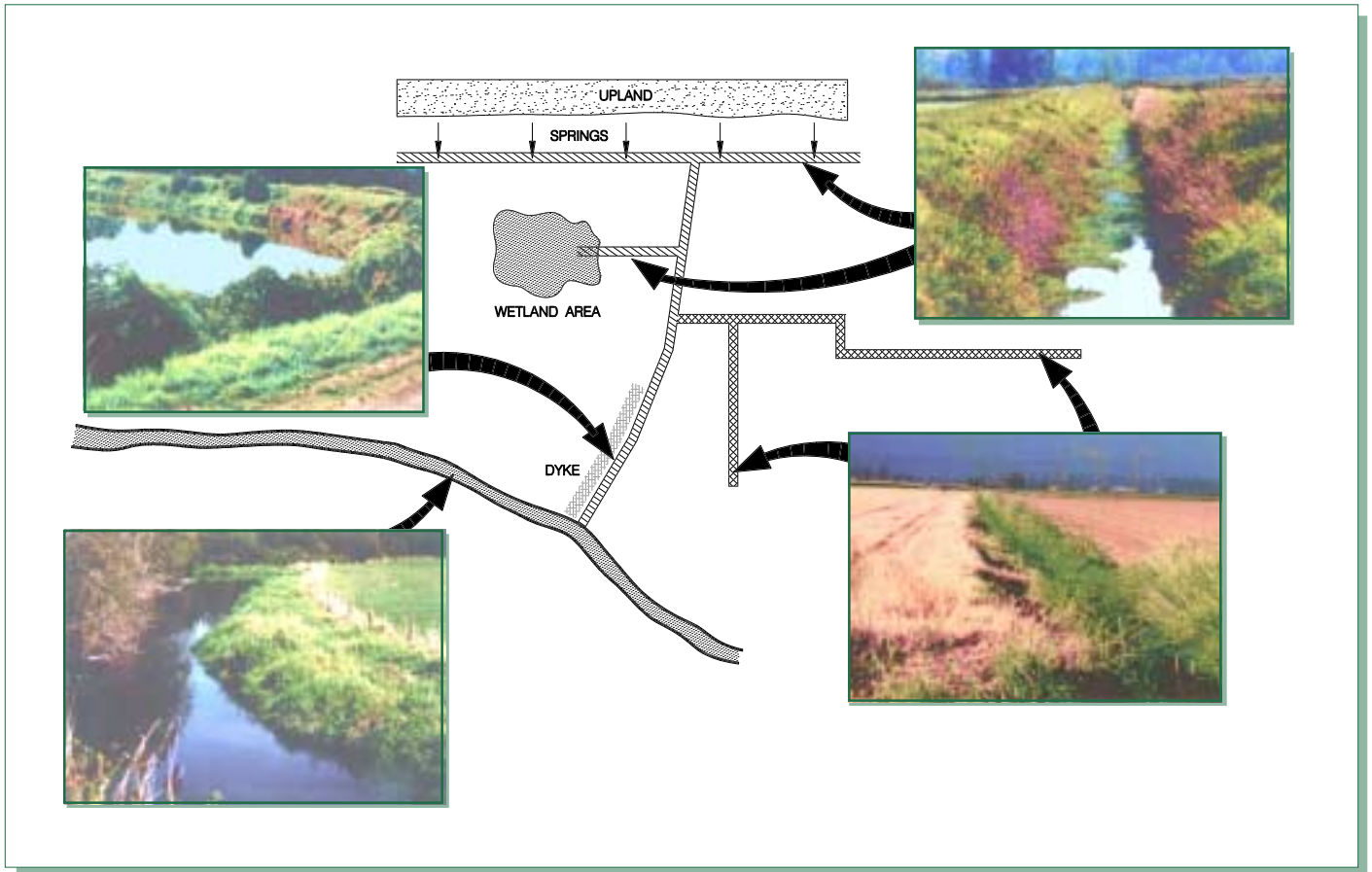


Figure 1 Visual of Watercourse Classification

Fish Presence

Once the type of watercourse has been defined the presence or absence of fish must also be determined. There are three categories that can be used; fish presence, fish absence and unknown fish presence.

Fish Presence

Fish may not be present at all times, however if fish rely on and use the watercourse during any portion of their life cycle then the classification should indicate fish presence. If there are no known or apparent obstructions in the channel, it is likely that fish are present at least at some time of the year. Additional information on timing of fish presence, species etc. can be included in the data base if this information is available.

Fish Absence

If fish cannot access the watercourse due to a permanent blockage or barrier then the fish absence category can be used. Temporary blockages for a portion of the year cannot guarantee that fish may not be present at other times.

Unknown Fish Presence

If fish absence cannot be determined but fish presence has not been verified the unknown category should be used. In many instances the unknown classification should be treated similar to a fish presence classification if significant works are to be done to the channel.

Watercourse Classification System

To illustrate the classification system on a map a combination of line types and colors are used. The categories for the watercourse are:


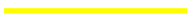


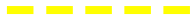




- Natural Streams – Solid Line
- Channelized Stream – Dashed Line
- Constructed Ditch – Dotted Line

The categories for fish presence are:

- Fish – Red colored lines (red is used to signify fish salvage is required)
- Fish Unknown – Yellow colored lines (use caution as fish salvage may be required)
- Fish Absent – Green colored lines (fish salvage not required)

The following table provides a breakdown as to how these categories are used.

Watercourse Classification System in Agricultural Areas

	Fish	Fish Unknown	Fish Absent
Natural	Solid Red Line 	Solid Yellow Line 	Solid Green Line 
Channelized	Dashed Red Line 	Dashed Yellow Line 	Dashed Green Line 
Ditches	Dotted Red Line 	Dotted Yellow Line 	Dotted Green Line 

An example of the color scheme for fish presence has been prepared for Surrey. (See Figure 2) The red areas denoting fish presence are primarily next to the Nicomekl and Serpentine rivers and the channels that flow into those streams. The green colors designate areas that are generally up lands where streams have been culverted and the channels filled in or changed due to roads and other development.



Figure 2 Fish Presence Color Scheme in Surrey

Presentation

The watercourse classification system is often incorporated into a Geographic Information System (GIS). Figure 3 shows the data layers that could be incorporated into a GIS system for agricultural areas. Different information collected by other agencies can also be incorporated into the various layers. The watercourse classification system would be part of the water features layer. Figure 4 is an example of the watercourse classification and fish presence layer as presented on a cadastre map. Figure 5 shows the same information as presented on an orthophoto.



Figure 4 Watercourse Classification on Cadastre Map



Figure 3 Data Layers for Agricultural GIS



Figure 5 Watercourse Classification on an Orthophoto

FOR FURTHER INFORMATION CONTACT

Ted Van der Gulik, Senior Engineer

Phone: (604) 556-3112

Email: Ted.vanderGulik@gems8.gov.bc.ca

RESOURCE MANAGEMENT BRANCH

Ministry of Agriculture, Food and Fisheries

1767 Angus Campbell Rd

Abbotsford, BC CANADA V3G 2M3