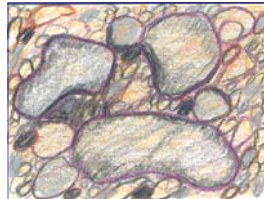### 1.2.3 IN-STREAM HABITAT

Parameter Guidelines

In-stream habitat assessment considers the suitability of the habitat for effective colonization by fish, amphibians and/or macroinvertebrates. This parameter does not consider the abundance or types of organisms present, nor does it consider the water chemistry and/or water quality of the stream. Other factors beyond the control of the stream condition (i.e. watershed conditions) also affect the presence or absence of aquatic organisms. Therefore, this category simply seeks to assess the suitability of physical elements within the stream to support aquatic organisms.

Physical elements of the stream system that enhance the stream's ability to support aquatic organisms include the following:

- A varied mixture of substrate size (i.e., sand, gravel, cobbles and   boulders);
- Low embeddedness and low amount of highly mobile substrate material;
- A varied depth and velocity of water (riffles and pools);
- The presence of woody and leafy debris, root mats and submerged vegetation;
- The presence of undercut banks (below bankfull); and,
- The provision of shade protection by overhanging vegetation.

| Dangling roots and undercut banks (below bankfull) | Embeddedness, mobility and size distribution of substrate | Leaf pack and woody debris |

A diverse and abundant assemblage of these features promotes the potential for colonization by diverse and abundant epifaunal and fish communities.   Provided on pages 21-24 are the specific parameters and photographs for the in-stream habitat quality conditions (i.e. poor, marginal, or optimal).

IN-STREAM HABITAT (cont)

POOR: Conditions are generally unsuitable for effective epifaunal colonization and/or fish cover. A stream is considered to provide poor in-stream habitat if any of the following conditions exist within the stream:

1. In gravel or cobble-bed streams (do not consider for silt or sand-bed streams) substrate is highly embedded (greater than 50%),

2. Substrate is homogeneous or highly mobile (do not consider for silt or sand-bed streams); or,

3. Lack of habitat is obvious. The stream exhibits few or none of the habitat elements listed in the parameter guidelines.

MARGINAL: Conditions are generally suitable for colonization by a moderately diverse and abundant epifaunal community. Potential fish cover is present, but is not abundant and does not occur evenly throughout the stream reach. Marginal in-stream habitat is present if the following conditions exist:

1. In gravel or cobble-bed streams, some large-particle substrate is present and the substrate is only moderately embedded (15 – 50%);

2. The stream bed contains a variety of substrate particle sizes; or,

3. Habitat availability is less than desirable, but suitable for at least partial colonization. Habitat elements listed in the parameter guidelines are present, but are not plentiful or distributed evenly throughout the reach.

OPTIMAL: Substrate is favorable for colonization by a diverse and abundant epifaunal community, and there are many suitable areas for epifaunal colonization and/or fish cover. Optimal habitat is present if the following conditions exist:

1. In gravel or cobble-bed streams, the substrate is neither highly mobile nor embedded (less than 15%); or,

2. The majority of habitat elements listed in the parameter guidelines occur frequently and are distributed evenly throughout the stream reach.

POOR IN-STREAM HABITAT: Homogeneous substrate material with high mobility. No overhanging vegetation or woody debris available. Very little variation in water depths and velocities.

POOR IN-STREAM HABITAT: Substrate is extremely mobile with no suitable bed material for colonization. Overhanging vegetation present, but insignificant due to extremely mobile substrate.

POOR IN-STREAM HABITAT: Substrate is extremely mobile. Over-hanging banks present, but due to channel downcutting and mobility of bed material, overhanging banks do not provide useful habitat.

MARGINAL IN-STREAM HABITAT: Overhead vegetation only along one bank and limited woody and leaf debris available. Only slight mixture of substrate material. Infrequent submerged roots or vegetation.

MARGINAL IN-STREAM HABITAT: Mixture of substrate material present, but slightly mobile. Incised channel prevents connectivity with majority of roots and vegetation.

MARGINAL IN-STREAM HABITAT : Some submerged vegetation, but only limited woody debris present. Some mixture of substrate material present, but not significant.

OPTIMAL IN-STREAM HABITAT: Small stream has a good mix-ture of wood and leaf debris available with abundant overhanging vegetation. Tree roots promote small riffles and pools.

OPTIMAL IN-STREAM HABITAT: Abundant submerged tree roots, multiple rock structures, and varying water depths provide excellent habitat. Overhead vegetation provides woody debris, as well as shade in growing season.

OPTIMAL IN-STREAM HABITAT: Good mixture of substrate material that is not significantly embedded. Varying water depths and velocities with abundant vegetation along water's edge provide excellent habitat.

NOTES: