ATTACHMENT 5—SIMPLIFIED KEY TO ORDERS AND FAMILIES OF AQUATIC INSECTS

This key is designed for use in the two rivers in southeastern Washington State based on what has been identified there in previous classes. With care, it probably also can be used in other streams in this general area. Complete sampling of other sites may provide additional families to this list.

Key numbers 1-7: Insect orders

Key numbers 8-11: Mayfly families (EPHEMEROPTERA)

Key numbers 12-14: Stonefly families (PLECOPTERA)

Key numbers 15-20: Caddisfly families (TRICHOPTERA)

Orders are capitalized (ODONATA); family names end in "idae."

Be sure to refer to the illustrations provided and referred to in the key; this will make your work much easier.

1a-With wing pads; nymph (Fig. 1a, 1b)

1b-Without wing pads; larvae (Fig. 2)

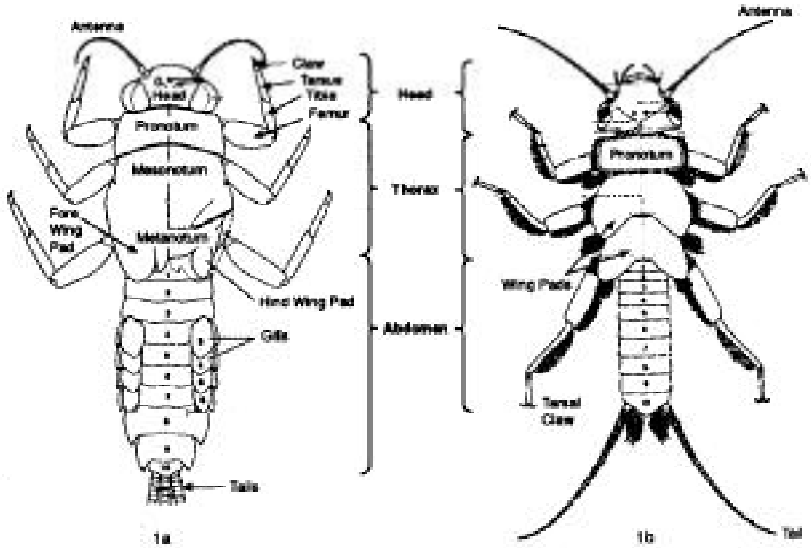

Figure 1. Generalized Nymph

2a-Tails absent—ODONATA, dragonflies

2b-Tails present (Fig. 1a, 1b)

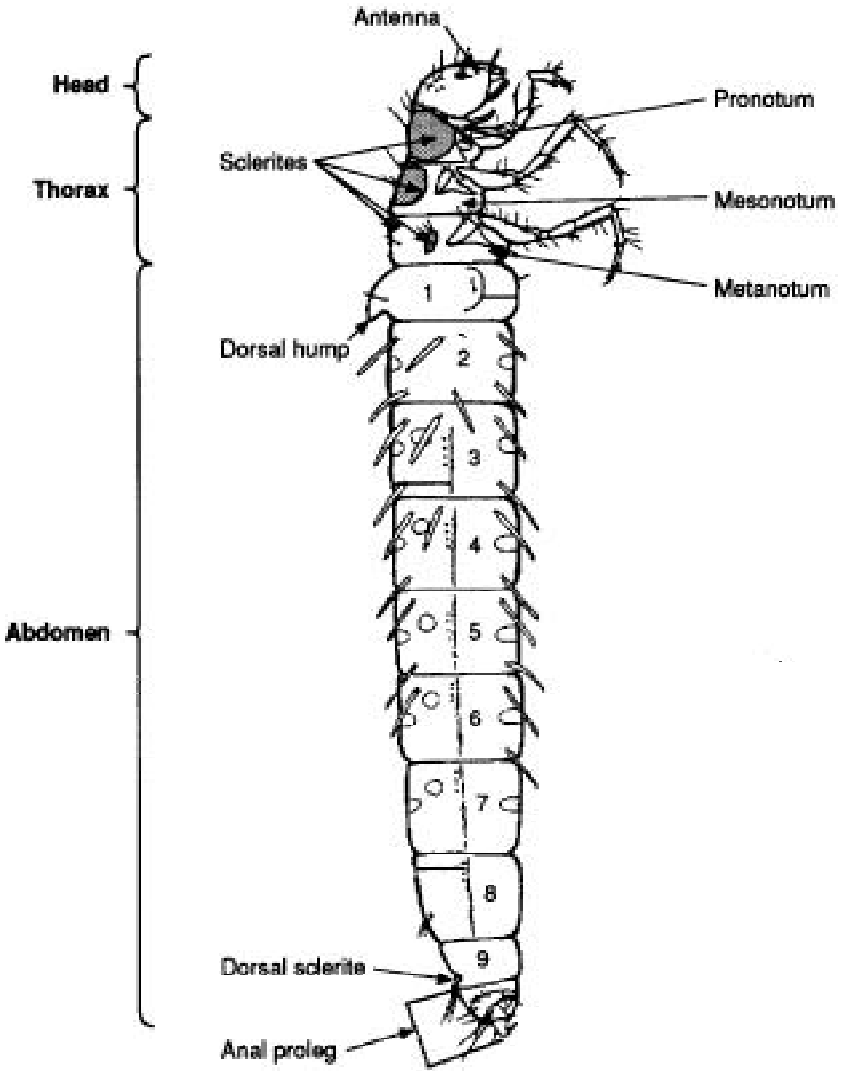

Figure 2. Generalized Larvae

3a-Tails flat and leaf-like (Fig. 3) ODONATA, damselflies

3b-Tails slender (Fig. 1a, 1b)

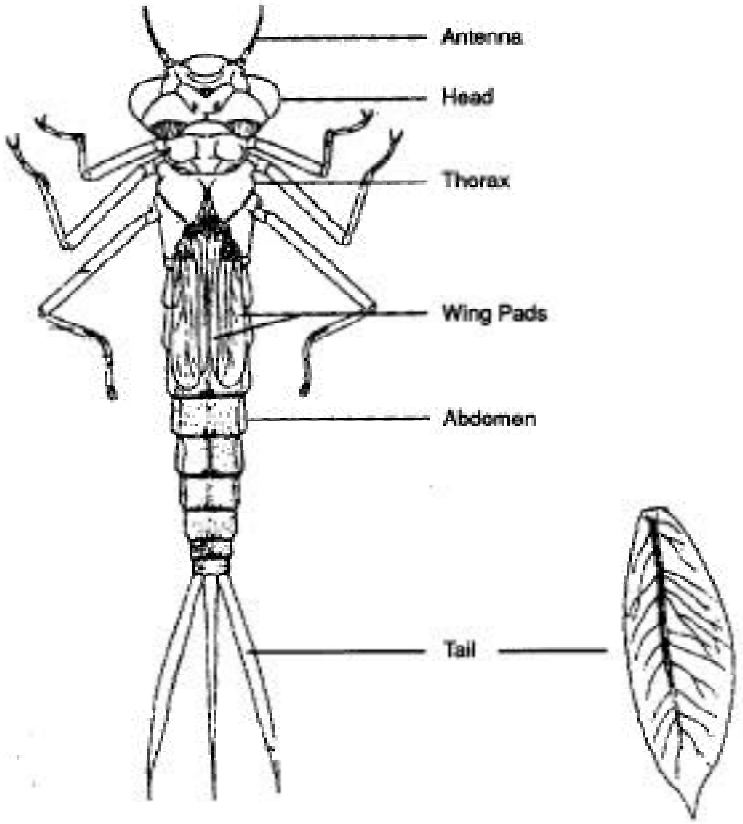

Figure 3. Damselfly Nymph

4a-One tarsal claw on legs, usually 3 tails (Fig. 1a) EPHEMEROPTERA, mayflies

4b-Two tarsal claws on legs, 2 tails, (Fig. 1b) PLECOPTERA, stoneflies

5a-No jointed legs on thorax DIPTERA, true flies

5b-Jointed legs on thorax (Fig. 2)

6a-Last abdominal segment with single pair of anal claws (hooks), which may be on "legs" (Figs. 2, 12) TRICHOPTERA, caddisflies

6b-No such hooks or two pairs

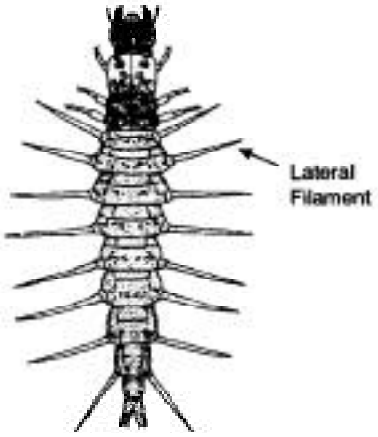

Figure 4. Megaloptera-Dobsonfly Larvae

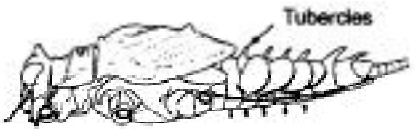

Figure 5. Mayfly Nymph, Family *Ephemerellidae*

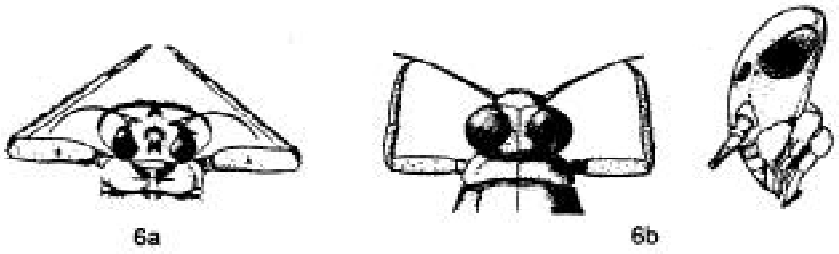

Figure 6. Mayfly Nymph Heads Indicating a) Flattened and b) Rounded Heads

7a-Abdomen with 7 or 8 pr of lateral filaments (Fig. 4) MEGALOPTERA, dobsonflies

7b-Abdomen without filaments—COLEOPTERA, beetles

8a-No gills on second abdominal segment (Fig. 1), gills with numerous lobes; tubercles usually on body (Fig. 5) Ephemerellidae

8b-Gills on first abdominal segment; no tubercies

9a-Nymph flattened; head flattened (Fig. 6a) Heptageniidae

9b-Nymphs not flattened; body and head rounded (Fig. 6b).10

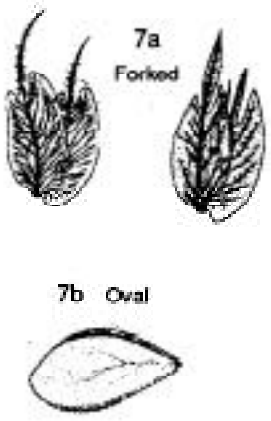

Figure 7. Gills of a Mayfly Nymph Showing a) Forked and b) Oval Gill Shapes

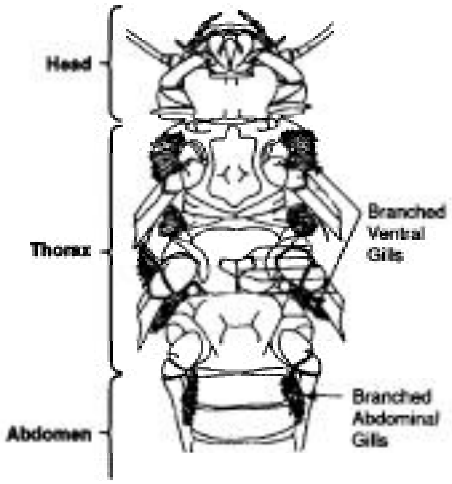

Figure 8. Underside of a Stonefly Nymph and Locations of Branched Gills

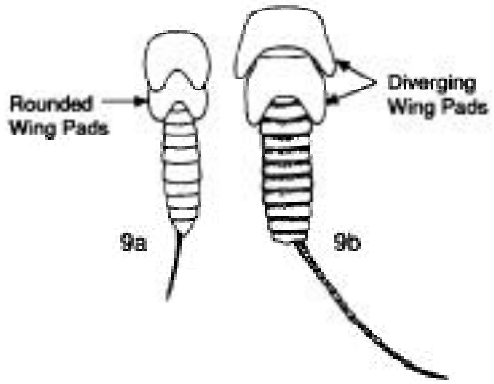

Figure 9. Wing Pad Orientation and Tail Lengths Differentiate Between Stonefly Nymphs of the a) *Chloroperlidae* Family and b) *Perlodidae* Family

10a-Gills forked (Fig. 7a) Leptophlebidea 10b-Gills oval (Fig. 7b)

11a-Antennae short, less than twice width of head (Fig. 1a) Siphionuridae

11b-Antennae long, more than three times width of head (Fig. 1a) Baetidae

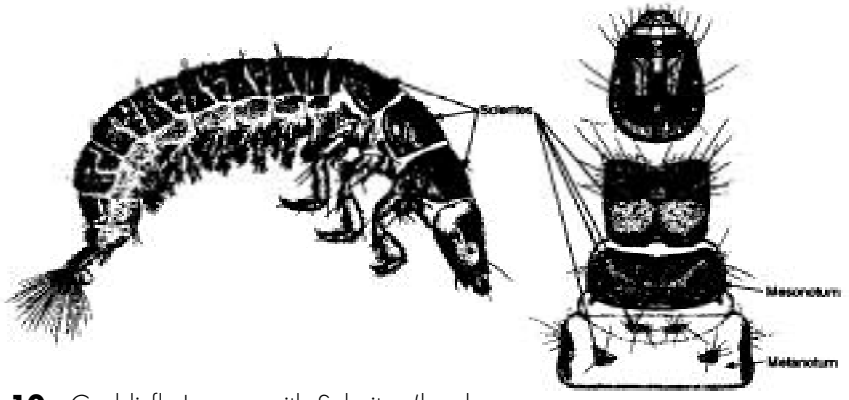

Figure 10. Caddisfly Larvae with Sclerites (hard, rigid plates) for its First Three Thoracic Segments

Figure 11. Front End of a Caddisfly Larvae Indicating Location of the Mesonotum (2nd thoracic segment) and Metanotum (3rd thoracic segment)

12a-Branched, ventral gills present on thorax (Fig. 8)

12b-Branched, ventral gills absent from thorax

13a-Gill tufts on thorax; not on abdominal segments (Fig. 8) Perlidae

13b-Gill tufts on thorax and abdominal segments 1-2 or 1-3 (Fig. 8) Pteronarcyidae

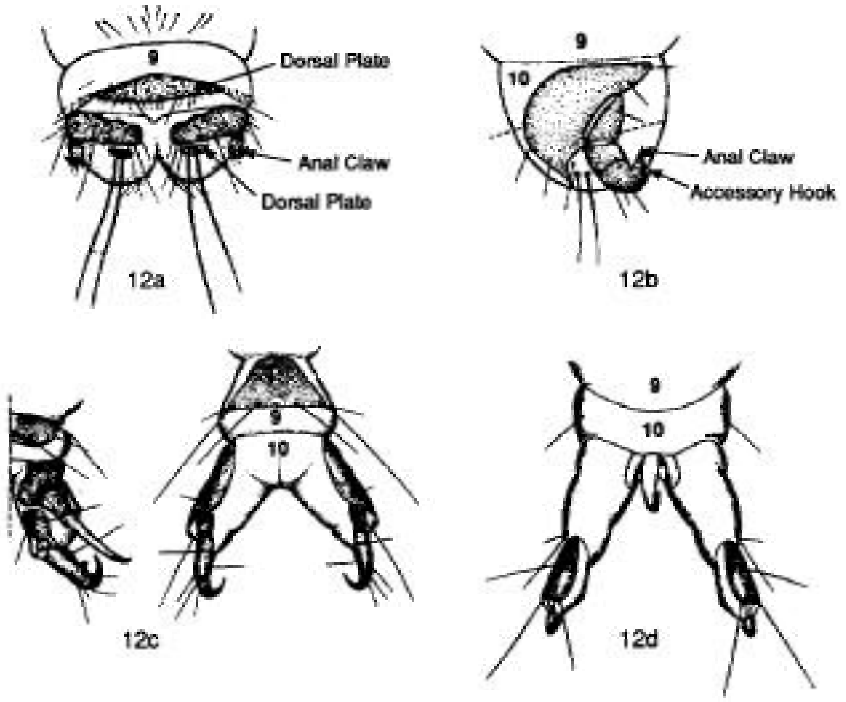

Figure 12. Abdominal Segments 9 and 10 of Caddisfly Larvae Indicating the Features That Distinguish One Family from Another

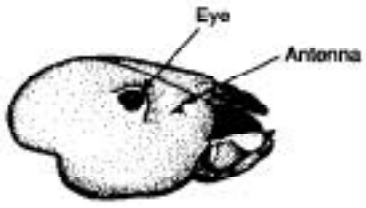

Figure 13. Head of a Caddisfly Larvae Showing Antenna Position Relative to the Eye—Used in Differentiating Between Families

14a-Tails shorter than abdomen; hind wingpads rounded and parallel to body axis (Fig. 9a) Chloroperlidae

14b-Tails as long or longer than abdomen; hind wingpads diverge from body axis (Fig. 9b) Perlodidae

15a-Dorsum (top) of 3 thoracic segments covered with sclerites' (Fig. 10) Hydropsychidae

15b-Metanotum (3rd thoracic segment) membranous, may have small sclerites (Fig. 11)

16b-Mesonotum (2nd thoracic segment) with sclerotized plates (Fig. 10, 11)

16a-Mesonotum membranous

17a-Abdominal segment 9 membranous (Fig. 12d) Philopotomidae

17b-Abdominal segment 9 with sclerotized dorsal plate (Figs. 2, 12a, d)

18a-Anal claw with accessory hook (Fig. 12a, b) Glossosomatidae

18b-No accessory hook on anal claw (Fig 12c, d) Rhyacophilidae

19a-Dorsal hump on 1st abdominal segment (Fig. 2)

19b-No dorsal hump—Brachycentridae

20a-Antennae half way between eye and front of head (Fig. 13) Limnephilidae

20b-Antennae closer to eye than front of head—Lepidostomatidae

Sclerites are small, hardened pieces of tissue similar to fingernails.