Note: This is a draft working outline of a handbook being developed by Kim Fulton, Contact: kfultondr_fish@yahoo.ca

Shuswap Watershed Project

Teacher's Resource Handbook

Outline:

Objectives: to provide study suggestions for students of all grade levels

1. provide project ideas
2. provide questions
3. provide sources for background information (books and websites)
4. show linkages to the curriculum
5. diagram/flow map of where our water comes from

Suggested : Questions that fit many or all categories:
Watershed report card
Temperature rising poster
Economies of watersheds
Government jurisdiction
Disturbance of watershed
Watershed timeline
Travel of an entire link – video, pictures
Topographical maps – cross sections, distances
Below the water – underwater features
Watershed models

1. Ranking – How does the watershed size (and other components such as the lake) rank against other watersheds?
2. Comparisons – How does the watershed (and other components) compare with others? Where are there similar features?

Topic areas:

1. fisheries
    a. salmon species – varieties, life cycle, history, hell's gate slide, role in ecosystem
    b. fresh water species – life cycles
    c. invasive species – source, impacts
        i. killing of invasive species – groundwater
        ii. why this method – is there another
            1. guest speakers
        iii. prevention
        iv. milfoil
        v. nutrients/pollutants from ocean
    d. management – goals, procedures, outcomes; DFO, MOE
        i. hatcheries
            1. where
            2. build one

speakers from DFO
potential of reintroducing a species (resurrect a run)

e. impacts from overfishing, logging, development, etc.
    i. statistical analysis – numbers caught/returning
f. upper Adams River disaster – loss of spawning grounds from splash dam
g. history of fisheries – traditional knowledge
h. survival issues
i. keystone species
j. cutouts of fish species that could be placed on the map
k. webcam

2. Impacts from development

Suggested Questions include how, where, why, who and when?

Accountability

Government agencies involved/privatization

Sewage treatment

Hormones

Building of models

a. foreshore – problems, solutions
    i. analysis of species
b. logging
c. urban run-off
    i. algae bloom
    ii. fertilizer/pesticide
d. recreation – 2-cycle motors, litter, noise, wake erosion
    i. limits
    ii. growth
e. agriculture run-off
    i. pesticides
    ii. winter manure
f. transportation
    i. spills – highway/railway
    ii. effect on lake

g. watershed living tips
h. wastewater
    i. resource vs liability
i. effectiveness of fish ladder
j. fish farming – stocking/harvesting of eggs/stocking program
    i. changes of behaviour/physiology
k. modelling
l. prevalence of species
m. relationship of freshwater and salmon
n. indicator species
o. management of freshwater species
    i. tagging

3. climate change
    a. basic causes of climate change
    b. potential impacts to watershed
    c. adaptation measures
    d. species at risk

4. Watershed habitats

Suggested questions include: Where do these features occur, what is the ecological value of these features, and where are there threats?

Historical

a. Wetlands - species, functions – values of wetlands, loss of wetlands and how this affects the watershed
    i. Map/zones/sensitive areas
b. Lakes – oligotrophic, mesotrophic, eutrophic
    i. Circulation
    ii. Acceleration of delta
    iii. How to reverse
c. Riparian habitats – value of riparian areas, best management practices
    i. enforcement
d. Fens
e. Diversity of forest types
    i. succession
f. Rare plant species
    i. Ecological reserves
g. Population counts
h. Change in climate – change in species
i. Migration corridors
j. Calendars – birds/plants/frogs

5. watershed values

Suggested questions include how management works, where there are concerns and why, and what improvements are needed?

a. drinking water
b. agriculture
c. ecosystem – wildlife habitats, rare species
d. cultural - recreation, tourism, economy
e. spiritual - First Nations
f. water quality – threats, how to maintain quality, algae blooms
g. connection to settlements
h. bioregionalism
i. NAFTA – water planning
j. Ownership

6. geological history
    a. topography, mountain ranges, rock formations
        i. high points
        ii. prior to the last ice age
    b. glaciers
    c. flow direction (once flowed to the Okanagan)
    d. faults
    e. soil formation
    f. history and characteristics of alluvial fans, deltas, floodplains
    g. mineral exploration
    h. Calvin van Buskirk - Terratec
7. Hydrology / geography
    a. water cycles
    b. water use
    c. water sources – tributaries – flow rates – stream characteristics – rapids, riffles cataracts, waterfalls
    d. stream order
    e. lake levels and depths, volumes, temperatures

f. watershed planning
g. role of lakes and types of lakes
h. hydro dam on Shuswap River
i. river continuum concept
j. lake circulation
k. rivers

Guide format

1. How best to make the guide useful?

Link on school/district website
On line GIS – College link
e-bird

a. Teachers
    i. 20-minute activities
    ii. Learning outcome defined
    iii. Maps with overlays – activities for overlays
    iv. Ranking system by users
    v. Links to studies/data
    vi. List of species and cut-out outlines
b. students

2. How best to structure the guide?
3. How can additional support be provided?
    a. Pro-d in science
    b. Interactive website - blog
    c.
4. How best to deal with controversial issues?
5. How can classes get involved in watershed protection activities?

Field trips
Salmon Arm foreshore
swamps
Turner Creek
Canoe Creek
Salmon River
Eagle River
Dam
South Canoe Reservoir
Sewage Treatment
Water Treatment
Mara Meadows
Larch Hills
School parking lot
Coyote ?
Kingfisher
Gardom Lake
Malakwa – Eagle River Nature Park
Enderby Cliffs
Salmon runs

Suggestion: Shuswap Watershed Week or Month

Each class in a school studies an aspect of the watershed; its history, chemistry, biology and geography. Students in English can write poetry, essays, letters-to-the-editor, and letters to government regarding the watershed. Art classes can use the watershed as the focus and there could be field trips to key watershed features. Music could involve local musicians and music with water themes. Film students could produce a mini-documentary. The week could end with a sharing session in the gym with artwork, music, films, maps, and research results.