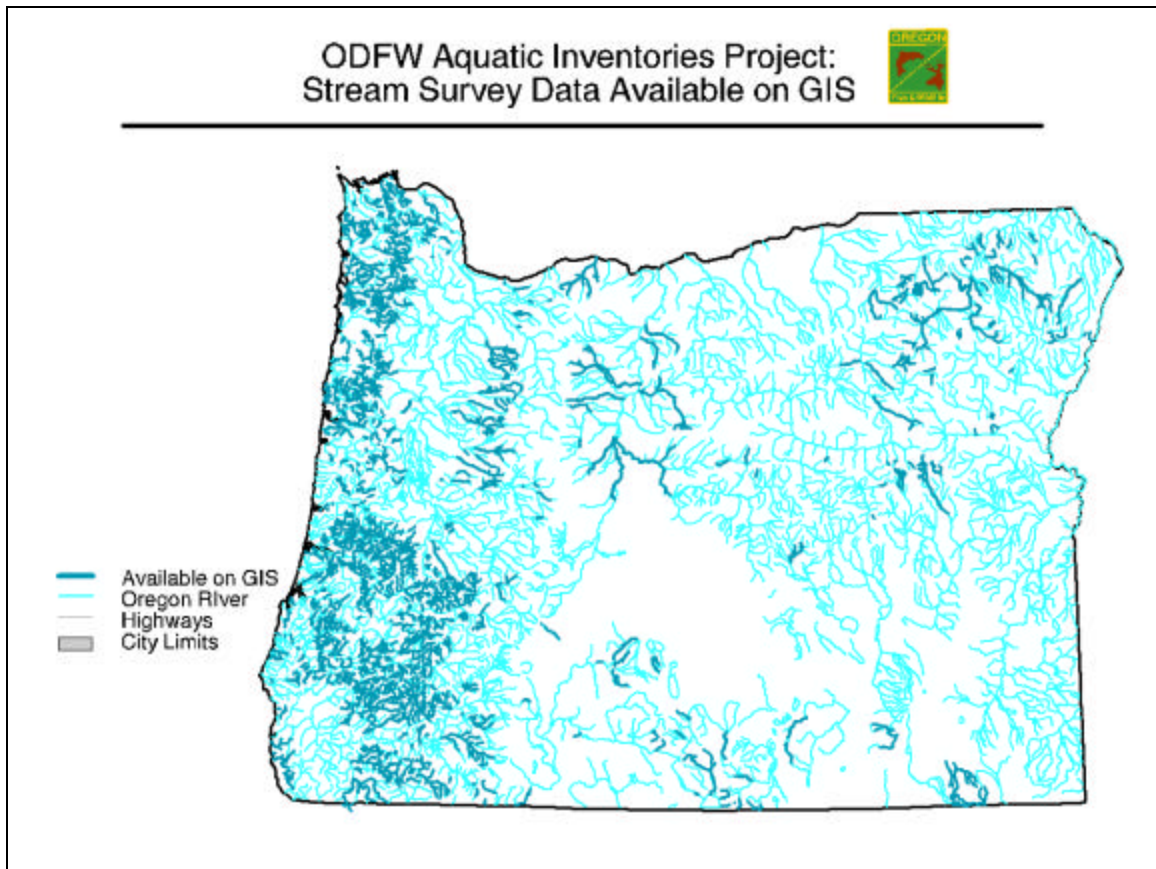


# The Oregon Department of Fish & Wildlife Aquatic Inventories Project

## Dynamic Segmentation Protocol

Rebecca Flitcroft, Stephanie Gunckel, and Jen Burke  
Revised, September 1999



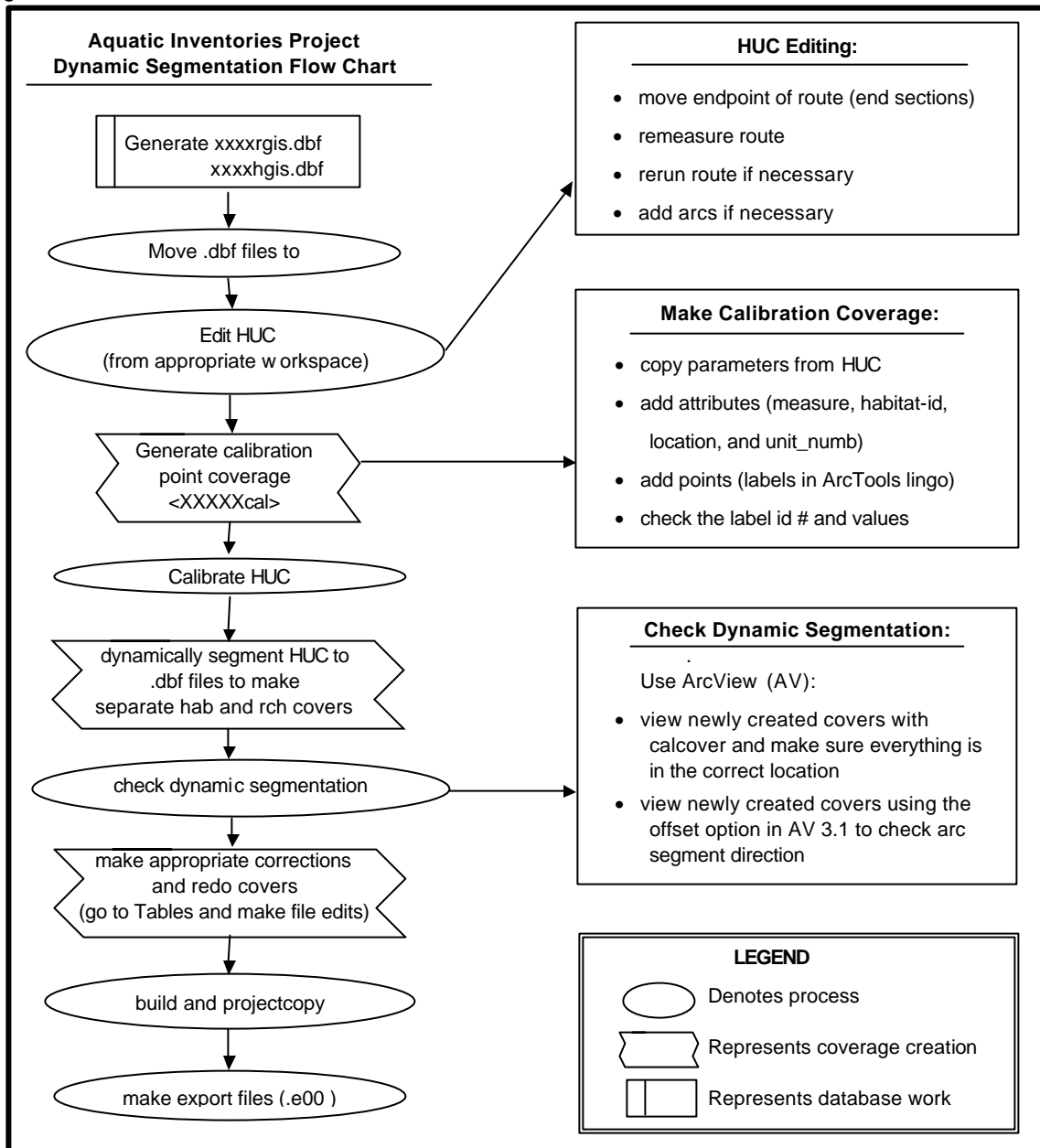
**TABLE OF CONTENTS**  
Dynamic Segmentation Protocol

<b><u>INTRODUCTION:</u></b>	<b>2</b>
<b><u>DBASE GYMNASTICS.....</u></b>	<b>3</b>
<b><u>GETTING STARTED:</u></b>	<b>5</b>
<b><u>HUC EDITING:</u></b>	<b>6</b>
<b><u>CALIBRATION COVERAGE:</u></b>	<b>8</b>
<b><u>DYNAMIC SEGMENTATION:</u></b>	<b>11</b>
<b><u>FINAL STEPS:</u></b>	<b>12</b>
<b><u>WHEN SOMETHING GOES WRONG....</u></b>	<b>13</b>
<b>Calibration</b>	<b>13</b>
<b>Routes</b>	<b>13</b>
Appendix 1: Naming Conventions/File Storage/Colors	<b>15</b>
Appendix 2: Handy Unix commands for when you're in a pinch.	<b>16</b>
Appendix 3: Useful arctools commands/information	<b>17</b>
Appendix 4: Useful ArcInfo command line commands and tables	<b>19</b>

**INTRODUCTION:**

The purpose of the aquatic inventories project dynamic segmentation protocol is to provide information necessary to attach stream survey information to a GIS. The programs used are Arc/Info and ArcView from a Unix platform. A quick overview of the entire procedure to generate habitat and reach coverages is listed in Figure 1. The directions associated with each step and with the applicable utilities can be found later in the instructions.

Figure 1: General Outline



## **DBASE GYMNASTICS.....**

Dbase is where it all starts.... It's important to get the data files together and formatted to assemble all pertinent information in one location. This can prove challenging when working with older data sets. As of summer 1999, this should have been taken care of, but just in case you run into some old data here's some tools to deal with it.

When assembling old data, it's important to keep in mind that the format has changed every year. The first few years of the project were particularly inconsistent about file structure (1990-1992). Therefore, the "standard" file names and descriptions may vary depending on who ran the report. This is important to keep in mind when you're running files through the GIS convert program (that Kim wrote). You may need to change the name or description of specific fields in order to make them compatible. Be sure to check the gishab and gisrch files once you've processed them. If there are blank fields, make sure you find out if they're blank because no data were collected, or because the gis convert program dropped the data. This could happen because of file name incompatibilities. It's important to check this, make field structure changes and carry on.

To summarize what's involved with dbase and file organization:

### **For Reach dataset:**

- 1) Query reachfnl (p:\invent\reach\statewide\reachfnl.dbf) and make a list of all streams in the huc.
- 2) Search the huc using ArcView and find the llid for each stream. Be careful that you identify the correct stream (there may be 4 Beaver Creeks on the huc. Don't just write down the llid for the first one you find).
- 3) Manually add the llid (or use a replace query) back to reachfnl in dBaseIV.
- 4) Query those records that have an llid and occur in the huc that you're working on. Save this query to a file (usually I name it <basin>rch.dbf).
- 5) Once you have the <basin>rch.dbf file made, shift to that one in dbase and query out each individual stream. Run this individual file through the gisconvert program. This will generate and populate the to and from distance fields into the file structure. You will then save this new file as <stream>rgis.dbf. When you have individual files for each stream generated you will need to append all of them together so as to create one large file for the huc. I would usually name this file the <basin>rgis.dbf file.
- 6) I will usually query the stream name, reach number, todist and fromdist fields and print a copy of the query. This gives me the necessary information to compare distance measurements with the comment summary data and generate the points that are necessary for the calibration part of the process.

- 7) A quick comment on calibration point selection... It seems to make it easier if some time is spent finding the final map of the survey. This is usually in the binders, or in the final report folder. A copy of this map (along with the comment summary) provides a base from which to assign calibration points. All reach breaks should be calibration points. Other points such as tributary junctions, bridge crossings or road crossings are good calibration points. It's a good goal to have about 1 calibration point per kilometer. When you define the calibration points you will also need to figure out the unit number at that point as well as the distance measurement from the start of the stream.

#### **For Habitat dataset:**

- 1) Find the appropriate data files. For 1990-1992 it will be the habitat reach (<stream>hr.dbf) file and the joined unit file <stream>ux.dbf file. For 1993-present it will be the habitat reach file (<stream>hr.dbf), the corrected joined unit file (<stream>ux2.dbf) and a riparian file (either <stream>rlk.dbf or <stream>rp.dbf). These files could be anywhere... well not quite, but sometimes it'll feel like it... Some places to check are:
  - Archives on the p drive under /invent/habdata/<basin
  - Check the disk backups that are in binders in the main work office.
  - Check the report file and raw data file,
  - Check tape back ups.
  - If you can figure out WHO did the report, you may want to scavenge the hard drive of that persons computer.
  - If all this fails, I have contacted forest service offices, BLM offices and district offices where we have sent diskettes containing the data files. Sometimes this works.
  - If all of these options fail, then you'll have to drop the dataset and move on.
- 2) Once you have the files step through the gis convert program that Kim wrote for dBase. There may be some file incompatibility problems. Check for things like field structure (numeric/character) or field names. Also, if there's an "!" in the file name remove it. Sometimes that will throw dbase off. Name the newly generated file <stream>hgis.dbf.
- 3) If you alter files or rerun reports SAVE EVERYTHING. It's important to leave a paper trail so that later on people can figure out what you did. Sometimes, when routes don't follow surveys you'll need to add reaches to reports. When this happens, the reach summary statistics and basic report have to be rerun. This also means that the report in the binder won't match the digital data on the gis (for the reach summary info anyway). If you're not going to rerun the entire report, but are simply adding reaches for the GIS then make a record of what you've done and why (a good place for this is in the excel file set up for gis dynseg tracking). Also, keep copies of the new reports that you ran in the folder for that huc. If you are re-running an entire report, replace it in the appropriate binder and the files on the p drive. Also, remember to send it to the agencies (aka ODFW District/BLM) that received the original report.

- 4) Once you have run all the new <stream>hgis.dbf files you will need to append them all together into one rather large habitat unit data file. I usually name this file <basin>hgis.dbf.

Once the <basin>hgis.dbf and <basin>rgis.dbf files have been generated they need to be moved over to the Unix side of the network. If this huc has not had work completed on it before you may need to add a file in /data/fry/aquinv/strmhab that corresponds to the new huc number. This shouldn't happen, but never say never..... There are two ways to make a new directory:

1. from windows explorer on the pc side: simply add a directory
2. from unix: the command line md <directory pathway>

When everything is working, and you've generated the GIS coverages, the unit and reach files used in the generation of the gis dataset are stored by huc at:

**p:\invent\gisdata\gisdone\**

**REMEMBER TO LEAVE A PAPER TRAIL!!!!!!**

### **GETTING STARTED:**

Before you go into Arc make sure you are working in the arcinfo workspace where you want to retain all of your coverages and associated tables. (Usually it's the workspace of the huc file located at: /data/fry/aquinv/strmhab/<huc number>)

From Unix Prompt:

**>arc72** (if you get message "word too long," see note in section titled "Handy Unix Commands for when you're in a Pinch")

If the huc that you are working on has not been previously edited then you'll probably need to set it up. This means that the arc export file needs to be opened, reprojected and the habitat edit feature created. (This is necessary because the digital line graph (dlg) files come to us in a projection that is incompatible with the other datasets that we use. You can either run these steps from the workspace for the hucs /data/fry/aquinv/huccover/<huc #> or from the streamhab workspace and enter the entire pathway to the files. These commands are written as if you were working from the huccover workspace.)

**import <option> <interchange file> <new coverage>**

import cover s7100307.e00 s7100307

**reproject <option> <in cover> <out cover> {projection file}**

reproject cover s7100307 w7100307 /data/fry/aquinv/utility/statelambert.prj

**copyfeatures <from\_cover> <from\_feature\_class> {to\_cover}**

**{to\_feature\_class} {ATTRIBUTES | GEOMETRY}**

copyfeatures w7100307 streams w7100307 habitat

Once this is accomplished, you can move into arctools and start editing that newly created habitat route layer in the newly reprojected working huc.

**arc:arctools**

select **edit tools** (An Edit Tools bar and ARCEDIT display screen will appear when ArcTools is opened. You will probably want to move the screen down so that when other tool bars appear they won't stack on top of one another)

go to **File- Coverage: Open** on the newly displayed tool bar to open the edit coverage. Arrow key up to data/fry/aquinv/ and choose huccover in the subdirectories box. Again, in subdirectories box choose <huc #> and in the coverages box pick <w huc>. Click on route.habitat in the available features box. Then click ok. The Routes and Sections Edit tools and Feature Selection Tools will appear.

go to **Display** in the Edit Tools ruler and then to **Draw env: General**. This allows you to change the display output of the edit coverage. You can select the feature you're interested in viewing and the drawing option. To clear all selections and start again (for say, when you've been looking at route.streams with arrows on and want to see arc with arrows on), go to clear all and then select your new options (otherwise the options will stack up). Make sure the draw box has a check in it. Click apply and then dismiss this window.

go to **Display** in the Edit Tools command ruler and then to **Back Env General**. Type in the pathway for the background coverage (ie. /data/fry/aquinv /datacvr/highways or the county road coverages). Hit return. This pathway should appear in the available back objects box. With the appropriate coverage highlighted, double click on **Arc** in the features box. A listing of options should appear. Double click on **SYMBOLS** to change the line color of the coverage. Click ok. Click on the draw box. A check should appear. Hit apply. To remove this window from view hit dismiss. (You can also select any of the other options, ON, IDS, ARROWS, INTERSECT, as is appropriate. These options may be changed at any time. To do so you will need to clear the previously defined view options by hitting the clear all button in this window. You will then need to reselect the appropriate coverage and the edit features desired.)

## **HUC EDITING:**

There are five basin components to editing hucs:

- 1) move endpoint of route
- 2) remeasure route
- 3) rerun routes if necessary
- 4) add arcs if necessary
- 5) save often! (I recommend saving after every stream.)

### **move endpoint**

**Select route** (it will turn yellow). Hit "9" to stop selection. Hit **subselect** button in Edit Routes and Sections window. A new Subselect sections toolbar will appear over the Feature Selection toolbar. You may want to move it. Select the **arrow** button and then select route sections by clicking on them using the crosshairs that appear on the display screen. The section will turn green when

selected. Delete the section if the end of the survey isn't within it (if there's multiple sections to delete use the select path subselection button). Once the section that contains the survey end point appears at the end of the route, subselect it and then press the **moveend** button from the Edit Routes and Sections window. A window will automatically appear with move end options. Make sure **Graphically** is selected. Hit ok. The cursor will turn into a hand. Depress the left mouse key and move the end of the section to the appropriate ending location.

Key buttons for selecting are:



Arrow (for selecting individual edit features)



Select Path (allows selection of multiple edit features. You select the first and last arc and ArcInfo will select all the intermediate arcs as well. This allows to to select ALL arcs on a pathway. It is sometimes difficult to do this manually because of small arcs.)

### remeasure route

**Select** the route. Hit the **REMSR** button. Select **User Defined**. Place appropriate values in the spaces for start measure and end measure (see todist/fromdist dbase printout page 3 point 6). Hit apply and then dismiss. **Subselect** all sections (using the Subselect toolbar). **View** the items (go to Table Editor and List.). Make sure that the **start measure** and **end measure** values correspond with one another and are in order. Check to make sure that the **directions (100-0)** are all the same and are continuous. (If there is a problem with either of these items, see the trouble shooting section.)

### rerun route

**Before deleting routes**, make sure that you view the items associated with the route and write down the stream name, id# and llid. (You will have to add these values to the new route.)

**Delete** old route (and routes of the other tribs if you're rerunning the route over another tributary. If you do this, make sure you change the edit feature to arc to change the item values for the arc to correctly reflect the new feat\_name and llid of the new route).

Hit the Create Routes (Arcs) button. A new window will appear. Hit **select path** box from Feature Selection toolbar. Select **start** and **end** points of route. Place the old id# in the new Route-id box. Hit apply and then cancel. Select the new route. Make sure that the stream arrow points upstream for the route. The arcs will be pointing downstream. If not, use the flip button. Be careful not to confuse the directions of the arcs and routes/sections. It's really easy to get lost in this so watch out for your draw environment and what features you've got turned on. Once you've got the arrows going the correct direction go into the table editor for the new route and edit it by adding huc number, llid and stream name. Now-

**select** route, do **moveend** and **remeasure**. **Subselect** all sections and check to and from distances and directions.

### adding arcs

This is something you should only do if the coverage is not for general distribution. Typically, this is not the case. However, should you need to do this, here's how it works.... Change **edit feature to arcs**. Change display environment to be only **arc arrows** (clear all and reselect arc with arrows). New edit buttons appear in the new Edit Arcs & Nodes window. Go to **add**. Use cross hairs to add arc. Make sure it intersects with the arcs that are already there. You will probably need to **flip** the arc direction. Hit **table editor** (w/Arc selected to the right). Select your new arc and go to **edit**. Place appropriate **huc #**, **feat\_name** and **llid** in their boxes. Now **change edit feature** back to route.habitat and **rerun** the route.

### troubleshooting

- if** to and from don't match, or directions are not same for all sections, check underlying **arc directions**. You will need to change the directions using the flip command from the Edit Arcs Window. You will most likely need to **rerun** the route.
- if** the route follows a trib that the survey crew didn't follow then **rerun** the route.
- if** you want a small part of a large stream **rerun** the route.
- if** you need to add an arc then **rerun** the route.

## CALIBRATION COVERAGE:

### Creating a Cover:

You will need to create a totally new coverage. To start, go to the **Edit Tools** command bar. Go to **File- Coverage: New**. Put in new calibration coverage name in **New Coverage** space. Select **LABEL** as the Feature. Leave **Subclass** blank. In **Optional source coverage** type in the pathway for the huc you're using (ie. /data/fry/aquinv/huccover/7100202/w7100202). Click ok. Now, go to the **Edit Labels** Window. Click on the **Table Manager** button. In the **Label items** window click **add** item button. Add:

- 1) Item name: **measure**, make sure the **int** button is pressed. Item width and display width should both be **8**. Decimals are **0**. Hit the add button.
- 2) Item name: **habitat-id**, make sure the **int** button is pressed. Item width and display width should both be **8**. Decimals are **0**. Hit the add button.
- 3) Item name: **location**, it's a character field (c) with item width and display width at 2.
- 4) Item name: **unit\_num**, this is an integer (int) field and should have a width and display of 4 with 0 decimals.

At the **Label Items** window, **select** the new items you've made and arrow key them to the right into the **Active Item** box. Click ok.

At the Edit Labels window use the add button to place new points on the coverage. You will want to bring up the huc, highways, roads, etc as background coverages for reference. Add the points one stream at a time. For the location item there's a code for the source of the point information. The codes for this are:

*bs- begin survey*

*tj- tributary junction*

*es- end survey*

*rb- reach break*

*bc- bridge crossing*

*cc- culvert crossing*

*xx- misc. unit*

*rc- road crossing*

Make sure that when you're selecting calibration points you have at least **ALL** the **REACH BREAKS** represented. There should be a calibration point about every kilometer. If there's a tributary or other natural feature close to a reach break, do **BOTH** of them. Reach breaks are crucial for the reach data to line up in the correct location.

### Snapping

You will also need to set the snap environment. This is accomplished by going to the **Edit Tools** bar. Click on **Tools- Snap environment**. In the **Snap from** box, the pathway of the current calibration coverage should appear. The associated **Feature** should be **LABEL**. In the **Snap to** box put in the pathway of the huc you have been using (ie. /data/fry/aquinv/huccover/7100202/w7100202). It's associated **Feature** should be **ARC**. Set the **snapping tolerance** to **50**. Click the **Add to Env** button. Now dismiss this window. After placing new points on the coverage, you will need to snap them. To do this, open up the command line window (**Edit Tools - Arctools- Commands**) and physically type in the word **snap**. Look at the terminal window and see if all the selected points have snapped. If not or if the point was snapped to the wrong location go through and snap each point individually. (It is a good idea to snap after every stream so that you can easily identify those points that have not snapped.)

### editing labels:

Once you have placed the points for a stream and snapped them, you will need to edit the values of each label. **Select** the points, go to **Table Editor** and press the **Calc** button. Place the stream\_id number into the open box. Click Apply. This will calculate all the selected points stream\_id field. Now, you will need to individually calculate the measure values for each label. Select **Edit** from the **Table Editor**. Place the appropriate measure value in the open box for each highlighted label. Click Apply. You can move forward or backward in the selected group by using the buttons on the Edit window.

**IT IS IMPERATIVE THAT YOU EDIT THE MEASUREMENTS IN ORDER from the mouth to the headwaters.** After all the edits have been made to the group of labels for the stream, select all the points and **list** them with the **Table Editor**. If the values aren't correct, or they are not listed in the appropriate order, you must re-enter or recalculate the values. **Save** the coverage after every stream

Leave ARCTOOLS and use the following command line in ARC to calibrate the routes on the huc:

**BEWARE!!** Don't run the **calibrateroutes** command unless you are absolutely sure that the calibration coverage is correct. To check for errors:

1. Display coverage with ID's and check for order.
2. Select multiple points and list them. Check that the distance measurements are in order.
3. If necessary check creek by creek.

Once **calibrateroutes** is run, you **SHOULD NOT** run the calibration again with the same huc and calibration coverage. Arc has a tendency to become confused if the same route system is calibrated twice. If you do find that corrections are necessary to the route layer after the calibration is run go ahead and make the corrections to the huc. (You'll probably need to rerun the route). If you would still like to use the automatic calibration (rather than manually splitting sections and remeasuring) select the points associated with the route and put them into a new coverage (commands are **select** and **put to cover** and are available in the edit feature command box in ArcTools). By using only these points in the calibration, the other routes on the coverage will not be calibrated "twice". See the "when something goes wrong" section for more details.

**calibrateroutes <huc coverage> habitat <calibrate coverage> habitat-id  
measure # split partial**

for example: `calibrateroutes /data/fry/aquinv/huccover/7100202/w7100202 habitat necan cal habitat-id  
measure # split partial`

## **DYNAMIC SEGMENTATION:**

Do the following two sections as one process per .dbf file. These sections must be completed from the Arc command line.

### **To Segment Arcs:**

**dbaseinfo <dbf file>.dbf <info table>** - do for each reach dbf file and habitat dbf file

**eventsource add linear <source name> <info table> info linear llid llid  
fromdist todist**

**eventsource save <eventsource>** (this saves the event table into an info file. It does not save it as an eventsource, this has already been done with the previous step. This is why you don't refer to this saved name in the eventarc command line.)

for example: (the stuff in italics is the stuff which will change for each coverage)

```
dbaseinfo rockhgis.dbf rockhab  
eventsource add linear habitat rockhab info linear llid llid fromdist todist  
eventsource save rockh
```

If you find that you need to kill a coverage and start over, remember to go into tables from the arc command prompt and kill the events that you created as well as the coverage. This way you can start over again. To read the list of files in your workspace, use the dir command in tables.

### **To Create a Coverage from an Eventsource:**

**eventarc <huc coverage> <subclass> <event name> <coverage name>**

for example:

```
eventarc /data/fry/aquinv/huccover/7100311/w7100311 habitat habitat rockhab
```

## **CHECKING YOUR WORK (all these steps are imperative!!!):**

### **Check to make sure all streams are there...**

Go into ArcView and open up the newly created rch and hab coverages. Also bring in the calibration coverage. If there are points where there is no stream, or a stream with no points then check it out!! It's probably due to:

1. The llid of the stream in the database is incorrect. You will need to go back into dbase and rerun the stream.
2. The llid on the coverage is incorrect. This could result from rerunning the route without correctly re calculating the llid. To fix the problem go into the huc and edit the route information. This doesn't necessarily mean you need to rerun the route, just check that the llid is assigned correctly.
3. The llid of an arc is incorrect. This is usually the result of creating an arc and not remembering to calculate the llid and huc of the arc before making it part of the new route. To fix this, you'll need to edit the arc and

rerun the underlying route. To go along with this, when you rerun a route remember to run the calibration ONLY on that edited route.

### **Check to make sure that the section directions are correct...**

Even though you check the sections after remeasuring there could still be an error at this stage. When the streams are calibrated, something strange and unexplainable sometimes happens at the `calibrateroutes` command. Some of the section directions will actually be changed. To check this, go into ArcView. Open up the coverage and double click on it. The box that changes the appearance of the data layer will appear. Go to display and "advanced". Check "offset". Then pick an offset distance (+ or - 1.0 works fine). Click apply. This will offset the coverage. If there is a place where the offset is discontinuous, there's a problem (ArcView offsets to the right (+) or left (-) based on the underlying section direction). You will need to go back into ArcTools and delete the route. Rerun the route and manually calibrate the sections to the map data. Then regenerate the hab and rch coverages and check for this problem again.

### **Before you export coverages...**

For some reason when Arc imports our dbase files it expands some of the numerical fields to a large number of decimals. This is O.K. as long as you use the coverages in UNIX. But PC ArcView does not like it!! The numerical fields need to be less than 19. You need to go to tables and fix widths. See commands in Tables section to fix widths before you export the coverage.

### **FINAL STEPS:**

#### **At the arc command prompt:**

**projectcopy cover <huc coverage> cover <coverage name>** (this is so that the newly created coverage will have spatial attributes.)

**build <coverage name> lines** (need to build every time you change something)

**export cover <input> <output>.e00 none** ("none" refers to no compression)

**copy <output>.e00 /data/fry/aquinv/e00/<output>.e00**

for example:

```
projectcopy cover /data/fry/aquinv/huccover/7100311/s7100311 cover rockhab
build rockhab lines
export cover rockhab rockhab.e00 none
copy rockhab.e00 /data/fry/aquinv/e00/rockhab.e00
```

## When Something Goes Wrong....

### **Calibration**

Calibrating the huc can pose a problem if:

- 1) You have already calibrated the huc once
- 2) You only need to calibrate one route
- 3) The calibration process itself has resulted in altered arc directions or shifted route directions

A crucial point to remember is that you must not calibrate the same route twice. This does not mean that you cannot calibrate a route, rerun the route and then calibrate it again. It means that you should not calibrate a route and then run the same calibration with the same points a second time. When you've rerun the route, you're essentially starting over from scratch. Arc will not become confused when it looks at the relationship between the calibration points and the route in its uncalibrated state. Therefore, if there is a mistake in the route that you notice after you have run a calibration it is okay to simply rerun the route and work on alternate calibration methods. Just **DON'T** use the same basinwide calibration coverage twice (unless you completely start the huc over from scratch). Should you need to rerun and recalibrate a route you have two options for calibration:

- 1) Manual calibration: In this option you subselect the section where a calibration point occurs and use the **split section** button in the edit box. This allows you to put a split in a section. Then select the section portions that correspond to the calibration points to and from distance and use the remeasure button to apply these measurements to the route.
- 2) Automated calibration: You can subselect the calibration points from the original calibration coverage (if you're using the same points) and use the **put to cover** button on the labels command box to put those points to a new coverage. This coverage would then have only the calibration points for the route that you're working on. This way you avoid recalibrating all the other routes on the huc.

### **Routes**

Routes can be particularly confusing if you find that arc directions are not lining up with route directions as they should. The direction of the arc and the direction of the route will most likely be opposite. This is just fine. It just presents a problem if you are checking arc directions using arrows and lose track of what you're looking at. Remember that if you change the draw environment you need to redraw the coverage to erase the old marks. (So if you're looking at arcs with arrows on and decide to change to routes with arrows on you'll need to turn off arc arrows, redraw the screen, then turn on route arrows and redraw the screen. This way the old arc arrows won't be left hanging around on the screen while you're trying to look at route arrows.)

If you find that the **route or section arrows are changing directions** intermittently, it's probably the result of a bad calibration. You'll need to rerun the route. Make sure that the underlying arcs are intact and all doing the correct direction.

If an underlying **arc is going the wrong way** then it's important to change the arc directions using the **flip** button. It also means that the route will need to be rerun.

## *Appendix 1: Naming Conventions/File Storage/Colors*

### **NAMING CONVENTIONS**

The following are the naming conventions we have used in the past. It is a good idea to stick with these to keep things consistent and neat. This way when you need to locate an eventsource or stream coverage, you will know what to look for and where.

Each stream is given a 5 letter base XXXXX.

Each component associated with that stream is a suffix or prefix of 1 to 3 letters:

**Calibration coverages:** XXXXXcal

**Eventtables:** XXXXXhab (for habitat data) or XXXXXrch (for reach data)

**Event source:** XXXXXh (for habitat data) or XXXXXr (for reach data)

**Eventarc** (final coverages): XXXXXhab or XXXXXrch (XXXXX = basin for new coverage)

### **FILE STORAGE**

Do not store anything in your user space

All info is in /data/fry/aquinv/

/datacvr: stores miscellaneous GIS files such as roads, geology, highways

/huccover: 1:100,000 HUCS

/maincvr: 1:100,000 HUCS without small tribs

/strmhab: Aquatic Inventories Project data and coverages organized by hucs

### **COLOR CODES**

**1** = WHITE

**2** = RED

**3** = GREEN

**4** = BLUE

**5** = TEAL

**6** = PURPLE MAGENTA

**7** = YELLOW

**8** = ORANGE

**9** = LIGHT GREEN

**10** = DARK GREEN

**11** = DARK BLUE

**12** = PURPLE

**13** = PINK

**14** = GRAY

**15** = DARK GRAY

*Appendix 2: Handy Unix commands for when you're in a pinch.*

## **HANDY UNIX COMMANDS FOR WHEN YOU'RE IN A PINCH**

“word too long” - 1. return to user directory (“cd”)  
2. type in at prompt: **rm .kisutch.winfig**  
3. at y/n prompt, type in **y**

**Keep in mind that Unix is case sensitive.....**

**rm filename** - to delete a file, may use \* convention when in a subdirectory

**rmdir directory** - to remove a directory once it is empty

**mkdir directory** - creates directory

**md directory** -creates directory

**cp file1 file2** - copies file1 to file2

**ls** - contents of current directory

**ls directory or path** - lists contents of another directory

**ps aux** - to check all the processes that are running on kisutch

**ps ux** - to check just your processes that are running

**kill -9 <PID>** - to kill a process (use ps ux to list processes and find PID)

To clear out trash... Trash box is located at:

**/users/<your user name>/.dt/Trash**

from here use the **rm** command listed above to remove the files.

## **USEFUL ARCTOOLS COMMANDS/INFORMATION**

### ***Routes and Sections Edit tools:***

This tool box allows for easy route editing and creation. The commands specifically useful for this project are described below:

**Create a Route:** this section is to be used when a route has been deleted and needs to be rerun. Make sure to change the draw environment to arc arrows and remove all other display features before using this section.

**Create Routes (ARC)** when you click on this box Arctools will automatically change the edit environment to arcs. A new window will appear. Leave all of the variables the same except for Route-id. This needs to be the route-id number of the route you are rerunning (therefore, before you delete it remember to write down the route-id #). You will need to select the Select Path Feature selection tool from the tool bar. It will allow you to select the start and end arc for the new route. Once the path is selected hit the apply box. You will want to check arc and section directions to make sure everything is working correctly.

**General Route Editing:** The commands in this section are useful in correcting existing routes.

**del** - to remove a route or highlighted section. If you plan to rerun the route, remember to write down the route-id #, stream name and lrid so you can associate these values with the new route.

**mvend** - necessary to move the end point downstream to the end of the habitat survey. It will only move the end of the selected section. If the end point is before this last section, delete the section and select the next section. Then move the endpoint. Use the Graphically option and you can manually move the point on screen.

**Edit Measures:** This command section is useful in editing both routes and sections.

**REMSR** - to remeasure the distance of a route to be consistent with the survey distance. First, select the route, and then click on REMSR. Go to the second option and put in a 0 as the start distance and then the ending measure for the stream in the from space.

**FLIP** - to flip arc or route directions

**Attributes:** A crucial section!!

**Table Mngr** - use to add items. Important for creating the attributes for the calibration coverage.

**Table Editor** - Allows you to edit values in attribute tables. Also important for calibration process. This is useful for displaying section values to make sure routing remeasure was successful. Need to do this to edit route attributes when you remake a route. Also use this to edit arc attributes (from the Edit Arc display window when arcs are the edit feature) when you have to make new arcs.

**RTE** and **SECT** buttons - method to toggle between routes and their sections for Table Editor display and editing.

**OOPS** - allows you to undo previous action

**Feature Selection Tools** (the way to stop selecting is to hit the **9 key** on the keyboard):

**Individual** use the arrow button. It allows you to individually select one or many features.

**w/in rectangle** button has a rectangle on it. It allows you to select multiple features by drawing a rectangle around them.

**w/in area** button has a closed shape on it. It will allow selection within an area defined manually.

**all** this says "all" on the button. It will select all edit features on the coverage.

**select path** this button must be found by first selecting the "more" button. This button's picture looks like a Z. It is used by selecting the first and last arc or section feature desired. It will then select all of the connecting arc or section features in between these two.

## Appendix 4: Useful ArcInfo command line commands and tables

### USEFUL ARC/INFO COMMAND LINE COMMANDS

**oops** - removes last command

**delete** - if in **editfeature route**, select route, type delete, and the entire route is deleted. Return to **select path** to resume creating route.

**move** - used to move points after points are added. Need to be snapped once moved.

**clear** - clears screen

**drop** - to delete an eventsource

**kill** <filename> **all** - to delete a coverage in Arc. If you're killing a coverage that was generated from an event then don't forget to go into tables also, select the event and kill it also (if you want to rebuild the event that is...)

**copy** <input> <output> - to copy a coverage in Arc

**w new workspace** -to change to a new workspace from within arcinfo

**ls** - contents of current workspace

**ls directory or path** - lists contents of another workspace

**lc** -lists coverages in workspace

**describe** <cover>- to list the projection information for a coverage

**project** <cover> <out cover> {projection file} - to change the projection of a coverage

**clip** <in\_cover> <clip\_cover> <out\_cover> {POLY | LINE | POINT | NET | LINK | RAW} - allows you to clip out a specific area based on the extent of the clip cover. If you're clipping a polygon coverage use poly. If it's a line coverage use line etc.

**usage** <command> - gives a parameter description for the command line command.

#### short cuts

editcoverage = **ec** -must be declared in order to edit

drawenvironment = **de** -the environment within which to work in - points(label id), arc arrows

createfeature = **cf** - to create a route or points on coverage

select = **sel**

calculate = **cal**

backgroundenvironment = **be**

backgroundcoverage = **bc**

remove background = **rb**

remove edit = **re**

#### To Add Arc or Extend Stream

**intersectarcs add** - This ensures that your arcs will actually be joined together.

**add** - Puts you in arc mode. Line crosshairs on the end of the stream and hit '2'. This will place a node at the point of intersection. Move the crosshairs to the point where you want the arc to end and strike '2' again. Hit '9' to exit. (Very similar to adding points). It is best to make this a straight line so that it will be easy to see that we had to add this section. Do not try to simulate the curve of the creek on the map. (check to see if the node or nodes dangle; nodes must be snapped for the arcs to be continuous)

### **drawe node dangle**

**draw** - dangling nodes will be indicated by square boxes. There should not be any dangling nodes where arcs intersect or extend from other arcs.

**nodesnap first \*** - \* = tolerance circle, must be smaller in radius than the arc being added

**add** - add arc between nodes

**snap** - should snap the nodes between the two arcs

repeat **drawe node dangle** to see if the process was a success!

Another command **split** will split an arc at the point selected. This is helpful should the creek fork and the arc continues up the fork that the crew did not survey. This should naturally occur when you add an arc, but sometimes ARC needs a little help. Type **split** and then select the point with the cross hairs that appear at which you want the arc split.



### **To Append Streams in a Basin:**

**append <new coverage> lines features** - you will be prompted for the coverage names. Don't forget to build the new coverage and check the fields in tables.

### **Tables (made easy...not):**

to fix item widths:

**tables** - takes you into tables

**select <coverage>.aat**

**items** - find the numerical items that exceed 19, usually they are the total conifer and small conifer items in the habitat dataset. Character field can exceed 19.

**alter <item name>** - Arc will prompt you for the changes you want to make. You only want to change the output width to 10. If you don't want to change the other fields just hit return to skip over them.

**items** - to double check you changes

**q**- exits out of tables. Now you are ready to export

*other general commands in tables:*

**select <filename>**

**calculate <itemname> = xxxx** for numeric items

or

**change** <itemname> **xxxx** for character items

**dropitem** **xxxx.aat** <item>

**additem** **xxxx.aat** <itemname> **8 8 f 0** <field in list before this one-for order>

**erase** <table name> do this after you select the table in order to get rid of an event source

**kill** <filename> to delete a file (must first have it selected)

*to view list of variables in tables:*

**items** <filename.aat> <fields> this allows you to see contents

or

**list** <filename.aat> to see fields

*in order to select a specific item in tables:*

**select** <file>

**reselect** <item name> = <whatever record you need>