WASHINGTON RIVERS INFORMATION SYSTEM

RESIDENT FISH DATA

DETERMINATION OF REACH SUMMARY VALUE

```
                        SUMMARY VALUE

         ENVIRONMENTAL                  RECREATION
            VALUE                         VALUE

    HABITAT        SPECIES         SOCIAL         ABUNDANCE
    VALUE          VALUE           VALUE

  Sum of:         Sum of:        ANGLER          GAME FISH
                                 USE]            ABUNDANCE
  Gradient        Population
  Substrate         Origin
  Instream        Game fish
    Cover           Value
  Riparian        Nongame Fish
    Cover           Value
  Water           Species of
    Quality         Concern
  Habitat
    Sensitivity
  Critical
    Spawning
```
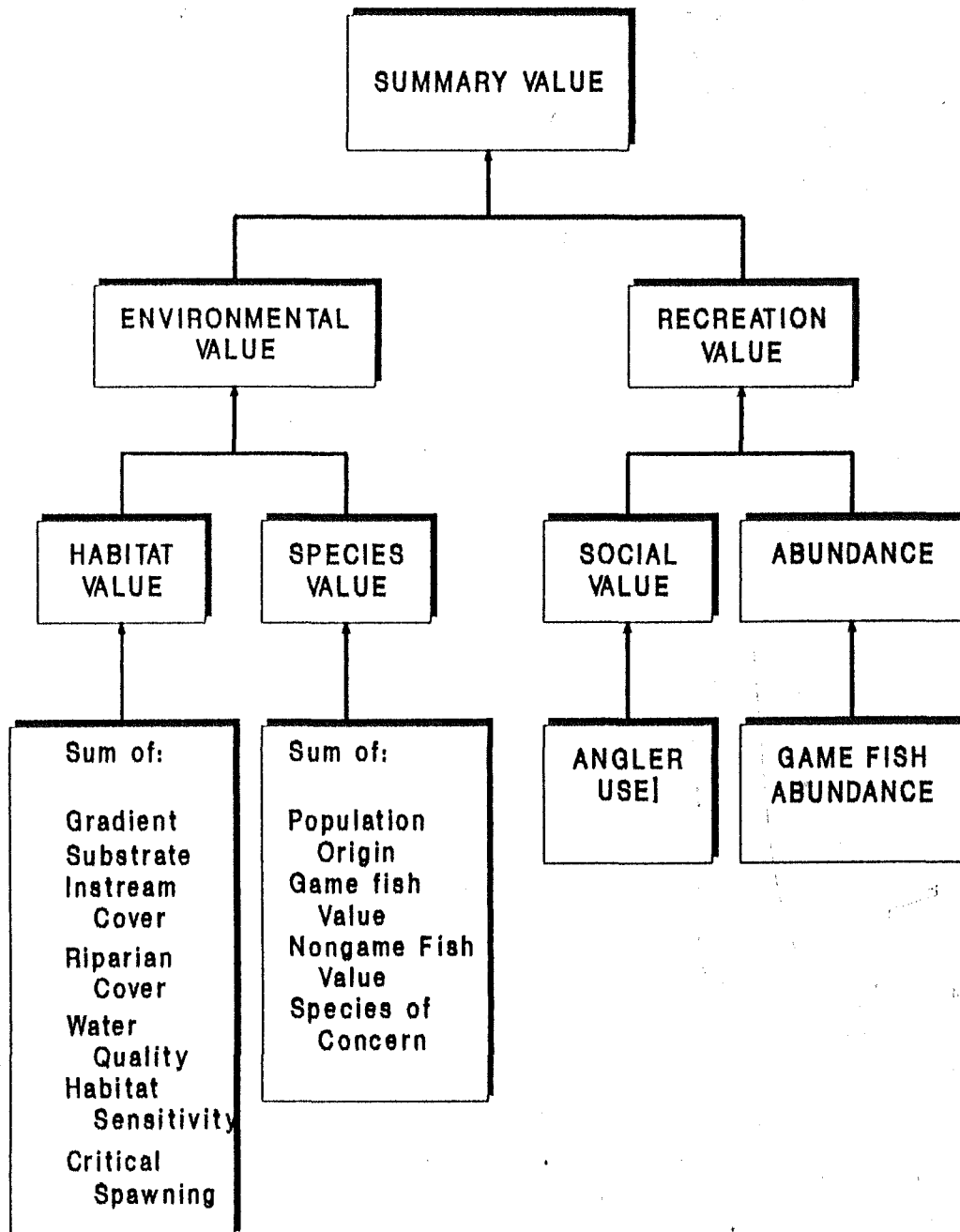
WASHINGTON RIVERS INFORMATION SYSTEM

RESIDENT FISH DATA UPDATE
DETERMINATION OF REACH SUMMARY VALUE

JANUARY 25, 1990

Data collected for an update of the resident fish portion of the Washington Rivers Information System (WARIS) will be summarized into a single value rating for each river reach at the 1:100,000 scale. This paper describes the procedures for determining that summary value from available data (see attached diagrahm).

DETERMINATION OF HABITAT, SPECIES, SOCIAL, ABUNDANCE VALUES

Data are divided into four logical groups: habitat data, species data, social values and fish abundance. Following are lists of data items included in each of these groups and a description of how those data are used to determine a SUMMARY VALUE for each group. The possible values of these data items are 1 = high value, 2 = medium value and 3 = low value, or a True/False flag. The values of a SUMMARY VALUE are 1 (outstanding), 2 (substantial), 3 (moderate), 4 (limited), 5 (poor).

HABITAT DATA

Gradient
Substrate
Instream Cover
Riparian Cover
Water Quality
Habitat Sensitivity (flag)
Critical Spawning (flag)

To determine the habitat summary value the following calculations are made:

HABITAT RANK = Gradient + Substrate + Instream Cover + Riparian Cover
+ Water Quality

HABITAT RANKS are then grouped to reclassify them into the 1-5 value scheme as follows:

POSSIBLE VALUES OF HABITAT RANK   HABITAT SUMMARY VALUE

POSSIBLE VALUES OF HABITAT RANK	HABITAT SUMMARY VALUE
5	1
6	1
7	1
8	2
9	2
10	3
11	4
12	4
13	5
14	5
15	5

HABITAT SUMMARY VALUE is then qualified by the two flags:

If HABITAT SENSITIVITY is TRUE the above summary values are upgraded by 1 (i.e. HABITAT SUMMARY VALUE minus 1).

If CRITICAL SPAWNING is TRUE the HABITAT SUMMARY VALUE is upgraded to a 1.

SPECIES DATA

> Population Origin
> Game Fish Value
> Nongame Fish Value
> Species of Concern (flag)

To determine the species summary value the following calculations are made:

SPECIES RANK = Population Origin + Game Fish Value + Nongame Fish Value

SPECIES RANKS are then grouped to reclassify them into the 1-5 value scheme as follows:

POSSIBLE VALUES OF SPECIES RANK   SPECIES SUMMARY VALUE
                 3 1
                 4 1
                 5 2
                 6 3
                 7 4
                 8 5
                 9 5

SPECIES SUMMARY VALUE is then qualified by the flag:

If SPECIES OF CONCERN is TRUE the above summary values are upgraded to 1.

SOCIAL VALUES

The only existing data in this group is ANGLER USE (a 1,2,3 - High, Medium, Low value). Because of this SOCIAL VALUE (at this time) is simply measured by ANGLER USE data. In the future we would like to add information on: ACCESS (distance to nearest road), ECONOMIC IMPORTANCE, CATCH PER UNIT EFFORT, SPECIAL MANAGEMENT RIVERS. This will help to balance out the information in each group.

FISH ABUNDANCE

The only existing data in this group is GAME FISH ABUNDANCE (a 1,2,3 - High, Medium, Low value). Because of this FISH ABUNDANCE (at this time) is simply measured by GAME FISH ABUNDANCE data. In the future we would like to add information on: STREAM ORDER, AGE CLASS DISTRIBUTION, NONGAME FISH ABUNDANCE.

DETERMINATION OF ENVIRONMENTAL AND RECREATION VALUES

ENVIRONMENTAL VALUE

The HABITAT SUMMARY VALUE and the SPECIES SUMMARY VALUE are combined using a matrix to determine the ENVIRONMENTAL VALUE. The values inside the following matrix become an ENVIRONMENTAL RANK (these ranks are calculated by adding HABITAT VALUE and SPECIES VALUE).

```
                         SPECIES VALUES
                  ------------------------
                  |   1   2   3   4   5
              --- ------------------------
               1 |   2   3   4   5   6
 HABITAT       2 |   3   4   5   6   7          Values inside the matrix become
 VALUES                                              the ENVIRONMENTAL RANK
               3 |   4   5   6   7   8
               4 |   5   6   7   8   9
               5 |   6   7   8   9  10
```

The RANK is then grouped to create a 1-5 ENVIRONMENTAL VALUE.

```
       ENVIRONMENTAL RANKS          ENVIRONMENTAL VALUE
              2 ......................................... 1
              3 ......................................... 1
              4 ......................................... 2
              5 ......................................... 2
              6 ......................................... 3
              7 ......................................... 3
              8 ......................................... 4
              9 ......................................... 5
             10 ......................................... 5
```

RECREATION VALUE

ANGLER USE and GAME FISH ABUNDANCE are combined using a matrix to determine the RECREATION VALUE. The values inside the following matrix become an RECREATION RANK (these ranks are calculated by adding ANGLER USE and GAME FISH ABUNDANCE).

```
                    GAME FISH ABUNDANCE
                  ------------------
                  |   1   2   3
              --- --------------
               1 |   2   3   4
 ANGLER        2 |   3   4   5          Values inside the matrix become
 USE                                          the RECREATION RANK
               3 |   4   5   6
```

The RANK is then grouped to create a 1-5 RECREACTION VALUE.

```
        RECREATION RANKS          RECREATION VALUE
             2  ........................... 1
             3  ........................... 2
             4  ........................... 3
             5  ........................... 4
             6  ........................... 5
```

DETERMINATION OF FINAL SUMMARY VALUE

The ENVIRONMENTAL VALUE and the RECREATION VALUE are then combined using a matrix to determine the SUMMARY VALUE. The values inside the following matrix become an SUMMARY RANK (these ranks are calculated by adding ENVIRONMENTAL VALUE and RECREATION VALUE).

```
                          RECREATION VALUES
                     ----------------------------
                     |    1   2   3   4   5
                  ---|------------------------
                   1 |    2   3   4   5   6

ENVIRONMENTAL      2 |    3   4   5   6   7      Values inside the matrix become
   VALUES                                            the SUMMARY RANK
                   3 |    4   5   6   7   8

                   4 |    5   6   7   8   9

                   5 |    6   7   8   9  10
```

The RANK is then grouped to create a 1-5 SUMMARY VALUE.

```
        SUMMARY RANKS                 SUMMARY VALUE
             2  ........................... 1
             3  ........................... 1
             4  ........................... 2
             5  ........................... 2
             6  ........................... 3
             7  ........................... 3
             8  ........................... 4
             9  ........................... 4
            10  ........................... 5
```

An alernative grouping for use with the State Hydropower plan is as follows:

```
        SUMMARY RANKS                    SUMMARY VALUE
            2  ........................... 1  --
            3  ........................... 1   |- RED ZONES
            4  ........................... 1  --
            5  ........................... 2  --
            6  ........................... 2   |- YELLOW ZONES
            7  ........................... 2  --
            8  ........................... 3  --
            9  ........................... 3   |- GREEN ZONES
           10  ........................... 3  --
```