

Table B-4. Hardhead Adult Habitat Suitability Curve Metadata.

| Curve ID                         | Used for MFP | Fish Characteristics |             |                             | Sample Size <sup>1</sup> |          | Stream Location |       |                | Stream Characteristics <sup>2</sup>    |                                      |                 |     |   |     |         | Sampling Info  |  |    |                     |                                  |                | Available HSC Curves |                            |                            |                         | Notes | Reference |                              |             |          |   |  |                        |
|----------------------------------|--------------|----------------------|-------------|-----------------------------|--------------------------|----------|-----------------|-------|----------------|--|--------------------------------------|-----------------|-----|---|-----|---------|----------------|--|----|---------------------|----------------------------------|----------------|----------------------|----------------------------|----------------------------|-------------------------|-------|-----------|------------------------------|-------------|----------|---|--|------------------------|
|                                  |              | Species              | Life-stage  | Length<br>Min (cm) Max (cm) | No. HSC Obs              | No. Fish | Country         | State | River          | Elevation<br>Min (ft msl) Max (ft msl) | Width<br>Mean (ft) Min (ft) Max (ft) |                 |     | Streamflow<br>Mean (cfs) Low (cfs) High (cfs) |     |         | Mean Slope (%) | Water Temperature<br>Mean (°F) Min (°F) Max (°F) |    |                     | Species Composition <sup>3</sup> | Site-Specific? | Sampling Season      | Survey Design <sup>4</sup> | Observ Method <sup>5</sup> | Curve Type <sup>6</sup> |       |           | Curve Smoothing <sup>7</sup> | Total Depth | Mean Col | Focal   | Cover <sup>8</sup>   | Substrate <sup>8</sup> |
| SFAR-PrAb, Pref and Util         | Y            | Hardhead             | adult       | >15                         | 93                       |          | USA             | CA    | SF American    | 1,900                                  | 2,000                                | 71              |     | 154   |     | 1.3     |                | 62   | 71 |                     |                                  | Aug            |                      |                            |                            |                         |       |           |                              |             |          |   | equal area; 3 methods used (utilization, preference, presence-absence) | TRPA 2000              |
| NFFR - Pref, Util, Density, PrAb | Y            | Hardhead             | adult       | >15                         | 140                      |          | USA             | CA    | NF Feather     | 925                                    | 2,010                                | avg<br>70 - 106 |     | 96  | 131 | 0.4-1.1 |                | 64   | 72 | skr,rbt,pkm,hdh,smb | Y                                | July-Aug       | EA                   | DO uw                      | II and III                 |                         | Y     | Y         |                              | Y           |          |   | 4 methods used (utilization, preference, pres-abs, density)            | TRPA 2001              |
| Pit Pref and Util                | Y            | Hardhead             | adult       |                             | 72                       |          | USA             | CA    | Pit            | 1,445                                  | 2,650                                | 40              | 200 | 50  | 150 | 0.7-1.1 |                |  |    | skr,rbt,pkm,hdh,smb | Y                                | summer         | RCH                  | DO uw                      | II and III                 |                         | Y     | Y         |                              | Y           | Y        | 2 methods used (utilization and preference; preference curve reweighted to equalize effort) | Baltz and Vondracek 1985   |                        |
| Deer Util and Electivity         | Y            | Hardhead             | adult       | >16 SL                      | 57                       |          | USA             | CA    | Deer           | 30                                     | 3,500                                | 20              | 50  | 100   | 200 | 1       |                | 50   | 90 |                     |                                  | June-Oct       |                      |                            |                            | II and III              |       | Y         | Y                            | Y           |          | Y   | 2 methods used (utilization and electivity)                            | Moyle and Baltz 1985   |
| Deer 3 juv + adult               | Y            | Hardhead             | juv + adult | >10 TL                      | 282                      |          | USA             | CA    | Deer           | 500                                    | 1,500                                | 50              | 60  | 120   | 140 | -       |                | 59   | 70 |                     |                                  | Aug-Sept       |                      |                            |                            | II                      |       | Y         | Y                            |             |          | only pools surveyed   | Alley 1977   |                        |
| W Sierra                         | Y            | Hardhead             | adult       | >12 TL                      | 437                      |          | USA             | CA    | Sierra streams | 203                                    | 1,460                                | 6               | 59  |   |     | 0.1-2.9 |                | 49   | 77 |                     |                                  | July - Oct     |                      |                            |                            | I/II                    |       | Y         | Y                            |             |          | reaches surveyed  | Knight 1985  |                        |

<sup>1</sup># HSC observations is number of independent measurements at fish positions, # fish is total number of fish seen at the measurement locations

<sup>2</sup>stream habitat characteristics during the period of sampling for HSC

<sup>3</sup>species abbreviations: chs=chinook salmon, coh=coho salmon, sth=steelhead, rbt=rainbow trout (resident), brn=brown trout, brk=brook trout, bul=bull trout, cut=cutthroat trout, wtf=whitefish, skr=suckers, scp=sculpin, pkm=pikeminnow, hdh=hardhead, dac=dac

<sup>4</sup>survey design: sampling design used to collect hsc data, i.e. reaches - samples collected in representative reach(es), proportional - samples collected within mesohabitat types with effort in proportional to availability, equal-area - samples collected with effort equalized among habitat types

<sup>5</sup>observation method: DOuw-direct observation underwater (snorkeling/scuba), DOow-direct observation out-of-water (wading, boat, or bank observation), EF-electrofishing, VID-underwater video, NET-seining or other net capture, Other (see comments)

<sup>6</sup>curve type: Cat I - hand-drawn or a composite of various curves based on professional judgment, Cat II - based on habitat use data, Cat III - based on habitat use data adjusted by habitat availability data, Bio - bioenergetics hsc

<sup>7</sup>curve smoothing: method used (if any) to smooth raw observation or frequency histogram data

<sup>8</sup>see hsc data sets for cover and substrate coding details