**Barnett and Paige (2014)**

* Nice paragraph about the distribution.
* Fish spawn in rivers but don’t seem to live in rivers.
* Spawning run fish … females were significantly larger than males. Largest Female as 238 (n=??), largest male was 215 (n=2678).
* “Most pygmy whitefish grew 1.0 to 4.0 mm per year …”. The largest increase in (fork length) was 21.1 mm (very much an outlier).
* One male was tagged at four years old (by scales) and recaptured five years later … thus suggesting that male life expectancy was at least 9 years.
* “Recapture of pygmy whitefish indicates that very little growth occurs in years after reproductive condition is reached …”

**Blanchfield et al. (2014)**

* Describes a new find in northwest Ontario
* Nice paragraph about the distribution, especially statements that the disjunctiveness may be related to difficulty in sampling.
* Length ranges very narrow (and n very small)

**Eschmeyer and Bailey (1955)**

* Table 14 shows size of age-0 fish in Sept and Oct … 30-40 in Sept, 40-45 mm in Oct
* Maximum length is 145 mm TL

**Hallock and Mongillo (1998)**

* Little new info.
* Some limited ages from one lake.
* Maximum TL was 246 mm (maximum age was 4).

**Heard and Hartman (1965)**

* Suggestion that PWF are 40-50 mm Fork Length at end of first-year
* Max age was 3 years in one popn, 5 in another
* Max FL was 163 mm.
* Said that “… scale annuli, which, excluding scales from a few older fish, were not difficult to locate.” (page 564)
* Body length at scale formation is between 22 and 27 mm
* Largest fish from Brooks Lake was 84 mm female, largest in South Bay was 168 mm female
* In both lakes females grew faster in each year except for the first year in one lake (p. 565)
* Provided a FL to TL conversion … TL=1.0777FL for FL<100 and TL=1.0845FL for FL>100
* Fish moved (only at night) into a river to spawn

**Kendall (1917)**

* Max TL was 158 mm (n=6)

**Lindsey and Franzin (1972)**

* Mostly described a small number of specimens from two new locations

**Mackay (2000)**

* PWF “also occur in fast moving montane rivers and streams …” cited McPhail and Lindsey and Mayhood.

**McCart (1963)**

* This is the dissertation that is the same as the McCart (1965) publication.
* Published a W-L relationship

**McCart (1965)**

* Only scales were used
* Table 3 contains an ALK for Cluculz Lake … Age-3 M showed 5 5-mm length classes, Age-4 and age-5 M showed 4. Age-3 F showed 5 5-mm length classes, Age-4 showed 7, and age-5 showed 4.
* Table 2 contains an ALK for Tacheeda Lake .. Age-2 M showed 6 5-mm length classes, Age-3 3. Age 2, 3, and 4 F showed 5 5-mm length classes, Age 5 showed 3.
* Table 5 contains an ALK for MacLure Lake. Age 2 and 4 M showed 6 10-mm length classes. Age-2 showed 5 10-mm length classes, age-3 4, age 4 and 5 4.
* Table 4 contains an ALK for McLeese Lake. Age-3 M showed 3 10-mm length classes and Age-3 F showed 4 10-mm length classes.
* Claimed that an annulus had formed and new growth was found on the scales by May
* Males and females grew at about the same rate for the first two years and then females were larger.
* Table 6-9 and Figure 3 shows increments in FL by year of life … 5-8 cm at age-1, 3-4 are age -2, 2-5ish for age-3 and 4, less than 2 after that.
* Maximum age was 9.

**McPhail and Zemlak (2001)**

* Scales and otos from 150 fish. Otos generally older
* “… there is some conflict between the estimate age and our length-frequency data.” Page 17
* Some evidence for merging of the length modes for 1+ and 2+ fish as the season progressed.
* Oldest was 7+ (female), 4+ (male)
* “… after age 2+ growth has slowed to the point that it obscures any clear differences among older age classes.”
* “ … males are smaller than females …” among reproductive sized fish. “Overall, the female fish were longer than the males for each age class.”
* “Female pygmy whitefish in Dina #1 appear to live longer than the males.”
* Showed weight-length data but did not compute W-L regressions

**Plumb (2006)**

* PWF age ranged from 0-7
* PWF TL ranged from 84 to 128 (n=91)
* Apparently aged fish from oto thin sections using two readers.
* Length-at-age was highly variable (see Figure 6) and did not show an asymptote.

**Sullivan (2011)**

* Documents very small numbers of PWF in rivers
* Figure 2 is a nice map of the distribution of PWF
* Very limited age analysis with otos … oldest fish was age-7
* Table 1 lists maximum ages from several studies.

**Taylor et al. (2011)**

* Primarily a genetics and evolution paper
* Good description of the distribution
* Some discussion of a few riverine populations
* Makes an argument that PWF are not deep, cold, oligo species that was described previously

**Weisel and Dillon (1954)**

* Limited study from PWF in Montana
* Used scales, maximum age was 2 (all small fish)

**Weisel et al. (1973)**

* Provided a SL to TL conversion … TL=0.21+1.19SL
* Len-at-age data from scales by sex (see Table 5 … in Excel now)
* Max age males was 3, females 4
* Most mature at age-1(males) or 2 (females).

**Wiedmer et al. (2010)**

* Mostly discussed the distribution of PWF in Alaska. Documented a new population on Cook’s inlet.
* A thorough listing of the distribution of PWF on Page 6 and Figure 6A

**Zemlak and MacPhail (2004)**

* “In 2000, we found that the first year’s annulus did not show on many scales. Thus, scales tended to underestimate age.”
* FL range 28-135 mm
* “the otoliths in y-o-y pygmy whitefish are small and fragile and it was not always possible to read them.”
* Otolith-scale ages agree on 23 of 27 YOY fish.
* YOY fish in October were 48-56 mm
* It is clear that they had difficulty ageing fish as well (see pp 21-23).
* Oldest female was 7, male was 4.
* “After age 2 growth appears to slow to the point that it obscures any clear differences among older age classes.”