

## Mayflies (Ephemeroptera) of the Great Plains. IV: South Dakota

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### ABSTRACT

The faunal inventory of the Great Plains state of South Dakota includes 15 families, 40 genera, and 77 species of Ephemeroptera, including the first published state records for 37 species, and 187 new county records for 64 of the species. The mayfly fauna of South Dakota includes transcontinental species, widespread species, many species that typify the central lowlands of North America, and some 18 species that find their eastern range limits in South Dakota, five species that find their northern range limits in South Dakota, and 16 species that find their western range limits in South Dakota and often additional states directly north or south of South Dakota.

### INTRODUCTION

This study represents the fourth installment in the study of the mayflies of the Great Plains regions of the United States, with faunal analyses of Nebraska (McCafferty et al. 2001), Iowa (McCafferty et al. 2003), and North Dakota (Guenther and McCafferty 2005) having preceded it. Among regional mayfly faunas, the Dakotas had been given high priority by McCafferty (2001) in terms of documenting the ranges of North American species. Prior to the present study, only 40 species of mayflies had been reported from South Dakota, and these often based on only one locale. Also, the first known species in the state was not reported until 1965 [the Allen and Edmunds (1965) report of *Ephemerella excrucians* Walsh (as *E. inermis* Eaton) from the Black Hills]. Since that time, most South Dakota records had been given by McCafferty (1990) and McCafferty and Kondratieff (1999). In this study we add 37 more species to the state inventory, bringing the total to 77 Ephemeroptera species documented for South Dakota.

In addition to the new South Dakota records, we also provide 187 new county records for 64 of the species. Our data demonstrate that among the North American mayfly fauna 18 mainly western species reach their easternmost range limits in South Dakota, 16 mainly eastern species reach their westernmost range limits in South Dakota, and five species reach their northernmost range limits in South Dakota. Westernmost range limits are often shared by other prairie states such as North Dakota, Nebraska, Kansas, or Oklahoma.

All previous mayfly data and their sources involving South Dakota collections are reviewed below, and new data are presented in their entirety. The new data refer to larval collections unless adults are specifically indicated. Counties are in upper case, and along with major waterways are shown in Fig. 1. Taxa are presented in alphabetical order, and biogeographic remarks are given for all species. The vast majority of materials upon which new data are based are housed in the Purdue Entomological Research Collection, West Lafayette, Indiana, and that deposition is applicable to all newly cited collections/samples, unless another

deposition is specifically indicated as BLAB (Bureau of Land Management/Utah State University National Aquatic Monitoring Center BugLab, Logan, Utah); INHS (the Illinois Natural History Survey, Urbana, Illinois); MIN (Entomology Collection, University of Minnesota, St. Paul, Minnesota); SCUK (the Snow Entomological Collection, University of Kansas, Lawrence, Kansas); USGS (the National Water Quality Laboratory, U. S. Geological Survey, Denver, Colorado); or VCSU (Valley City State University, Valley City, North Dakota).

#### FAUNISTIC DATA

##### Baetidae

##### *Acentrella insignificans* (McDunnough)

*Previous data.*—Moriyama and McCafferty (1979): FALL RIVER (Hot Brook). McCafferty (1990): FALL RIVER (Hot Brook).

*New data.*—BUTTE: Redwater R at Jolly, 44/37/08N 103/49/12W, 13-VI-2004, D Gustafson; Redwater R at US Hwy 85, 8 km N Spearfish, 44/35/26N 103/51/38W, 24-IX-2003, J & C Guenther. CUSTER: Battle Cr at St Rd 79, 1 km S Hermosa, 43/50/03N 103/11/56W, 26-IX-2003, J & C Guenther. FALL RIVER: Hot Brook at S 6<sup>th</sup> St in Hot Springs, 44/01/06N 103/39/03W, 26-IX-2003, J & C Guenther. HAAKON: Cheyenne R at Four Corners Rd, 13 km SE St Rd 34, 44/31/13N 101/59/29W, 23-IX-2003, J & C Guenther; Cheyenne R at St Rd 34, 44/31/48N 101/55/38W, 7-VI-2000, P McCafferty et al. HARDING: Little Missouri R at Camp Crook, St Rd 20, 45/22/54N 103/58/16W, 7-VI-2000, P McCafferty et al. LAWRENCE: False Butte Cr SE crossing on St Rd 34, 44/36/34N 103/47/17W, 7-VI-2000, P McCafferty et al.; Redwater R at US Hwy 85, 8 km N Spearfish, 44/35/26N 103/51/38W, 23-IX-2003, J & C Guenther. MEADE: Belle Fourche R at St Rd 34, 6 km W Hereford, 44/30/47N 103/08/13W, 23-IX-2003, J & C Guenther. TODD: Antelope Cr at Hidden Timber Rd, 3 km NW Hidden Timber, 43/15/06N 100/28/16W, 29-V-2003, P McCafferty et al. TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al. ZEIBACH: Cheyenne R at Four Corners Rd, 13 km SE St Rd 34, 44/31/13N 101/59/29W, 23-IX-2003, J & C Guenther.

*Remarks.*—*Acentrella insignificans* is a common species throughout western North America. South Dakota, North Dakota (Guenther and McCafferty 2005), and Nebraska (McCafferty et al. 2001) form its easternmost known range limits.

##### *Acentrella parvula* (McDunnough)

*New data.*—TODD: Little White R at small unnamed bridge, Crazy Horse Canyon ca 5 km S Iron Shell Bridge, 43/12/07N 100/58/02W, 29-V-2003, P McCafferty et al.

*Remarks.*—This species is distributed across much of central and eastern North America, as far south as Texas (Wiersema 1998), and reaching north to southern Canadian provinces (McCafferty and Randolph 1998).

##### *Acentrella turbida* (McDunnough)

*New data.*—TODD: Antelope Cr at Hidden Timber Rd, 3 km NW Hidden Timber, 43/15/06N 100/28/16W, 29-V-2003, P McCafferty et al.

*Remarks.*—This transcontinental species (McCafferty and Meyer 2007) is the most commonly taken *Acentrella* Bengtsson across North America.

***Acerpenna macdunnoughi* (Ide)**

*Previous data.*—McCafferty and Kondratieff (1999): BEADLE (Hitchcock); MINNEHAHA (Big Sioux R).

*Remarks.*—South Dakota and Oklahoma (Baumgardner and Kennedy 1999) form the westernmost known range limits of *A. macdunnoughi*.

***Acerpenna pygmaea* (Hagen)**

*Previous data.*—McCoy and Hales (1974): DEUEL (nr Moritz); GRANT (N Fk Yellowbank R). McCafferty and Kondratieff (1999): BRULE (Missouri R).

*New data.*—GRANT: S Fk Yellowbank R at US Hwy 77 bridge, 1 km N US Hwy 77 and US Hwy 20 jct, 13-V-1978 [SCUK].

*Remarks.*—This is a relatively common transcontinental species (McCafferty and Meyer 2007).

***Baetis bicaudatus* Dodds**

*Previous data.*—McCafferty and Kondratieff (1999): LAWRENCE (Spearfish Cr).

*Remarks.*—Western South Dakota and Nebraska (McCafferty et al. 2001) constitute the easternmost known range limits of this species.

***Baetis brunneicolor* McDunnough**

*Previous data.*—McCoy and Hales (1974) as *B. Phyllis* Burks: DEUEL (Florida Cr, Monighan Cr, nr Moritz); GRANT (N Fk Yellowbank R, S Fk Yellowbank R); ROBERTS (nr Summit). McCafferty (1990): CUSTER (French Cr); PENNINGTON (Grizzly Bear Cr).

*New data.*—BUTTE: Redwater R at Jolly, 44/37/08N 103/49/12W, 13-VI-2004, D Gustafson.

*Remarks.*—This mainly eastern North American species has recently been found as far west as Idaho and Washington (McCafferty and Meyer 2007).

***Baetis flavistriga* McDunnough**

*Previous data.*—McCoy and Hales (1974) as *B. phoebus* McDunnough and *B. cingulatus* McDunnough: DEUEL (Crow Timber Cr, Florida Cr, Lost Cr, nr Moritz, Monighan Cr); GRANT (N Fk Yellowbank R, S Fk Yellowbank R); ROBERTS (nr Summit). Morigara and McCafferty (1979): LAWRENCE (Boxelder Cr); PENNINGTON (Grizzly Bear Cr, Rapid City, Rapid Cr). McCafferty (1990): CUSTER (French Cr); PENNINGTON (Grizzly Bear Cr, Rapid City, Rapid Cr); LAWRENCE (Boxelder Cr).

*New data.*—CUSTER: Battle Cr at St Rd 79, 1 km S Hermosa, 43/50/03N 103/11/56W, 26-IX-2003, J & C Guenther; Beaver Cr nr Pringle, 14-V-2003 [USGS]; Cold Spring Cr at 61 m above confluence of Beaver Cr, 15-V-2003 [USGS]. LAWRENCE: Boxelder Cr at Co Rd 26, Vanocker Can Rd, 6 km SE Nemo, 44/09/12N 103/27/51W, 24-IX-2003, J & C Guenther; Boxelder Cr at Co Rd 26, Vanocker Can Rd at Nemo, 44/11/47N 103/30/11W, 24-IX-2003, J & C Guenther; Whitewood Cr at US 85 in Deadwood, at Super 8 Motel, 44/21/57N 103/43/57W, 24-IX-2003, J & C Guenther. PENNINGTON: Rapid Cr at 32<sup>nd</sup> St in Rapid City off St Rd 44, 44/04/05N 103/16/16W, 29-V-2003, P McCafferty et al.; Spring Cr at US 385 and St Rd 244, 5 km SW Hill City, 43/53/35N 103/35/

17W, 25-IX-2003, J & C Guenther.

*Remarks.*—This one of the most widespread and ubiquitous species of mayflies in North America.

***Baetis intercalaris*** McDunnough

*Previous data.*—McCoy and Hales (1974): DEUEL (Florida Cr); ROBERTS (nr Summit). McCafferty (1990): LAWRENCE (Boxelder Cr); PENNINGTON (Rapid Cr, Rapid City).

*New data.*—BROWN: Elm R, 4 km NW Westport, below dam, 45/40/12N 98/32/24W, 28-VII-2002, D Dockter [INHS]. CLAY: Vermillion R at 312<sup>th</sup> St, 9 km NNE Vermillion, 42/51/59N 96/53/48W, 28-V-2003, P McCafferty et al.; Vermillion R at St Rd 19, 23 km N Vermillion, 42/59/27N 96/57/48W, 28-V-2003, P McCafferty et al. CORSON: Grand R, Standing Rock Reservation, 45/43/10N 101/56/01W, 5-VIII-2003 [VCSU]. HARDING: Little Missouri R at Camp Crook, St Rd 20, 45/22/54N 103/58/16W, 7-VI-2000, P McCafferty et al. MOODY: Big Sioux R at Co Rd B, 6 km E I-29, 16 km SE Brookings, 44/09/09N 96/41/13W, 22-IX-2003, J & C Guenther. TURNER: Vermillion R at St Rd 19, 3 km S Centerville, 43/05/19N 96/57/45W, 28-V-2003, P McCafferty et al. UNION: Brule Cr, 2 km E Spink at St Rd 48, 42/51/04N 96/43/47W, 27-V-2003, P McCafferty et al.; Missouri R at 471<sup>st</sup> Ave, 10 km W Elk Point, 42/39/58N 96/47/11W, 26-IX-2003, J & C Guenther.

*Remarks.*—Besides South Dakota, North Dakota (Guenther and McCafferty 2005), Nebraska (McCafferty et al. 2001), Kansas (Liechti 1978b), Oklahoma (Waltz et al. 1996), Texas (McCafferty and Davis 1992), and Saskatchewan (Webb et al. 2004) constitute the westernmost known range limits of this common baetid species.

***Baetis magnus*** McCafferty and Waltz

*Previous data.*—McCafferty and Kondratieff (1999): LAWRENCE (False Bottom Cr).

*Remarks.*—South Dakota and Nebraska (McCafferty et al. 2001) constitute the northernmost and easternmost known range limits of this species.

***Baetis tricaudatus*** Dodds

*Previous data.*—McCoy and Hales (1974) as

*B. vagans* McDunnough: DEUEL (Crow Timber Cr, Florida Cr, Monighan Cr, Lost Cr); GRANT (N Fk Yellowbank R, S Fk Yellowbank R); ROBERTS (nr Summit). Morihara and McCafferty (1979): LAWRENCE (Boxelder Cr, Iron Cr, Jim Cr, Spearfish Cr); PENNINGTON (Rapid Cr). McCafferty (1990): FALL RIVER (Hot Brook); LAWRENCE (Boxelder Cr, Iron Cr, Jim Cr, Spearfish Cr); PENNINGTON (Rapid Cr).

*New data.*—BUTTE: Redwater R at Jolly, 44/37/08N 103/49/12W, 13-VI-2004, D Gustafson; Redwater R at US 85, 8 km N Spearfish, 44/35/26N 103/51/38W, 24-IX-2003, J & C Guenther. CUSTER: Battle Cr at St Rd 79, 1 km S Hermosa, 43/50/03N 103/11/56W, 26-IX-2003, J & C Guenther; Beaver Cr at St Rd 71, 3 km NW Buffalo Gap, 43/30/48N 103/19/36W, 26-IX-2003, J & C Guenther; Beaver Cr nr Pringle, 14-V-2003 [USGS]; Highland Cr above Madison Outcrop, 13-V-2003 [USGS]. FALL RIVER: Cascade Springs at Cascade Falls St Rd 71, 16 km S Hot Springs, 43/19/18N 103/33/43W, 26-IX-2003, J & C

Guenther; Cheyenne R at St Rd 71, 19 km S Hot Springs, 43/18/20N 103/33/49W, 26-IX-2003, J & C Guenther. LAWRENCE: Boxelder Cr at Co Rd 26, Vanocker Can Rd, 6 km SE Nemo, 44/09/12N 103/27/51W, 24-IX-2003, J & C Guenther; Little Spearfish Cr at FR 222, 2 km W Savoy, 44/21/05N 103/56/15W, 24-IX-2003, J & C Guenther; Little Spearfish Cr at Timon Campground, FR 222, 44/11/53N 103/35/09W, 17-VIII-2003, C Lamb; Redwater R at US 85, 8 km N Spearfish, 44/35/26N 103/51/38W, 24-IX-2003, J & C Guenther; Spearfish Cr at Hellsgate Gulch, 44/16/46N 103/54/02W, VI-13-2004, D Gustafson; Spearfish Cr at US 14, 6 km NW Elmore across from Billie Ln, 44/20/40N 103/55/13W, 24-IX-2003, J & C Guenther; Spearfish Cr at US 14 in Elmore, 3 km N Cheyenne Crossing, 44/18/55N 103/53/02W, 24-IX-2003, J & C Guenther; Spearfish Cr at Savoy, 44/20/60N 103/55/23W, 13-VI-2004, D Gustafson; Whitewood Cr at US 85 in Deadwood, Super 8 Motel, 44/21/57N 103/43/57W, 24-IX-2004, J & C Guenther. MEADE: Bear Butte Cr at E end Sturgis, 44/24/51N 103/29/34W, 7-VI-2000, P McCafferty et al. PENNINGTON: Castle Cr at Mystic Rd, Co Rd C318 in Mystic, 7 km W Silver City, 44/04/35N 103/38/31W, 25-IX-2003, J & C Guenther; Rapid Cr, 22-VII-1977; Rapid Cr at Mystic Rd, FR 231, 4 km N Mystic, 44/06/14N 103/39/10W, 25-IX-2003, J & C Guenther; Rapid Cr at tailwaters of Pactula Lake off US 385, 6 km E Silver City, 44/04/32N 103/29/03W, 25-IX-2003, J & C Guenther; Slate Cr at Mystic Rd, Co Rd C318, 10 km S Mystic, 44/01/06N 103/39/03W, 25-IX-2003, J & C Guenther; Spring Cr at US 385 and St Rd 244, 5 km SW Hill City, 43/53/35N 103/35/17W, 25-IX-2003, J & C Guenther. TODD: Little White R at small unnamed bridge, Crazy Horse Canyon ca 5 km S Iron Shell Bridge, 43/12/07N 100/58/02W, 29-V-2003, P McCafferty et al. UNION: E Union Cr at St Rd 48, 12 km E Spink, 42/51/05N 96/35/49W, 29-V-2003, P McCafferty et al.

*Remarks.*—This transcontinental species is the most common species of Baetidae in the western United States (e.g., McCafferty et al. 1993, 1997a, Meyer and McCafferty 2007a,b).

***Callibaetis ferrugineus* (Walsh)**

*Previous data.*—McCafferty (1990): CUSTER (Bismark Lk Campground).

*New data.*—CUSTER: Sylvan Lk, Black Hills, 17-VI-1942, C Alexander (adult).

*Remarks.*—This is a relatively common transcontinental species (McCafferty and Meyer 2007).

***Callibaetis fluctuans* (Walsh)**

*Previous data.*—McCafferty (1990): FALL RIVER (Fall Cr Reservoir).

*New data.*—LAWRENCE: Boxelder Cr at Co Rd 26, Vanocker Can Rd at Nemo, 44/11/47N 103/30/11W, 24-IX-2003, J & C Guenther.

*Remarks.*—This species is a relatively common transcontinental species (McCafferty and Meyer 2007).

***Callibaetis pallidus* Banks**

*Previous data.*—McCafferty (1990): CUSTER (Paulson's Pond).

*New data.*—MEADE: V-1939, H Telford (adult) [MIN]; STANLEY: Fort Pierre, 6-VI-2000, P McCafferty et al. (adult).

*Remarks.*—This species has a scattered range in North American from the

southwestern United States (Lugo-Ortiz and McCafferty 1995a), through some north-central states (Randolph and McCafferty 1998, Guenther and McCafferty 2005), across central Canada (McCafferty and Randolph 1998), and in some north-eastern states (e.g., Burian and Gibbs 1991, Jacobus and McCafferty 2001).

***Callibaetis pictus*** (Eaton)

*Previous data.*—McCafferty (1990): CUSTER (Stockade Lk); FALL RIVER (Hawkwright Cr). Jacobus and McCafferty (2002): FALL RIVER (Hawkwright Cr).

*New data.*—BROOKINGS: Errington Marsh, 3 km W Bruce, 10-IX-1990, M Brinkman; BROWN: Elm R, 4 km NW Westport, below dam, 45/40/12N 98/32/24W, 28-VII-2002, D Dockter [INHS].

*Remarks.*—North Dakota (Guenther and McCafferty 2005) represents the northernmost range limits of this species, and North Dakota along with South Dakota and Iowa (Klubertanz 1995) constitute the easternmost range limits of this western species.

***Callibaetis skokianus*** Needham

*New data.*—SPINK: nr Mellette, VII-29-1972, G Godfrey (adult) [INHS].

*Remarks.*—North Dakota (Traver 1935), South Dakota, and Saskatchewan (Thew 1959) constitute the westernmost known range limits of this northeastern and central North American species.

***Camelobaetidius warreni*** (Traver and Edmunds)

*Previous data.*—McCafferty (1990) as *Dactylobaetis cepheus* Traver and Edmunds: FALL RIVER (Hot Brook).

*New data.*—HAAKON: Cheyenne R at Four Corners Rd, 13 km SE St Rd 34, 44/31/13N 101/59/29W, 23-IX-2003, J & C Guenther; Cheyenne R at St Rd 34, 44/31/48N 101/55/38W, 7-VI-2000, P McCafferty et al. HARDING: Little Missouri R at Camp Crook, St Rd 20, 45/22/54N 103/58/16W, 7-VI-2000, P McCafferty et al. MEADE: Belle Fourche R at St Rd 34, 6 km W Hereford, 44/30/47N 103/08/13W, 23-IX-2003, J & C Guenther. TODD: Little White R at small unnamed bridge, Crazy Horse Canyon ca 5 km S Iron Shell Bridge, 43/12/07N 100/58/02W, 29-V-2003, P McCafferty et al. TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al. ZIEBACH: Cheyenne R at Four Corners Rd, 13 km SE St Rd 34, 44/31/13N 101/59/29W, 23-IX-2003, J & C Guenther.

*Remarks.*—North and South Dakota, Saskatchewan (McCafferty and Klubertanz 1994), and Nebraska (McCafferty et al. 2001) constitute the easternmost known range limits of this species.

***Centroptilum album*** McDunnough

*New data.*—LAWRENCE: Whitewood Cr at Whitewood Valley Rd, 10 km SW Sturgis, 44/28/25N 103/37/28W, 24-IX-2003, J & C Guenther.

*Remarks.*—Larvae of this mainly central and eastern United States and trans-Canada species were collected from cobble in a small stream.

***Centroptilum victoriae*** McDunnough

*New data.*—TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, V-29-V-2003, P McCafferty et al.

*Remarks.*—This species has historically been known as a Canadian species (e.g., McCafferty and Randolph 1998); however, recently several eastern and other central states were added to its distribution by Wiersema and McCafferty (2004) and McCafferty et al. (2004).

***Dipheter hageni*** (Eaton)

*Previous data.*—Moriyama and McCafferty (1979): LAWRENCE (Jim Cr); PENNINGTON (Rapid Cr). McCafferty (1990): LAWRENCE (Jim Cr); PENNINGTON (Rapid Cr). Meyer and McCafferty (2001): BEADLE (Hitchcock); LAWRENCE (Jim Cr); PENNINGTON (Rapid Cr).

*New data.*—CUSTER, Flynn Cr, 43.686, -103.476, 24-VIII-2001 [BLAB]; Greater Cool Cr, 47.782, -103.406, 24-VIII-2001 [BLAB]; Iron Cr, 24-VIII-2001 [BLAB]. LAWRENCE: Boxelder Cr, 44.211, -103.551, 23-VIII-2001 [BLAB]; Spearfish Cr at Savoy, 44/20/60N 103/55/23W, 13-VI-2004, D Gustafson; Spearfish Cr at Hellsgate Gulch, 44/16/46N 103/54/02W, 13-VI-2004, D Gustafson; Spruce Gulch Cr, 44.366, -103.714, 9-III-1999 [BLAB]. PENNINGTON: Beaver Cr, 44.070, -104.039, 23-VIII-2001 [BLAB]; Slate Cr at Mystic Rd, Co Rd C318, 10 km S Mystic, 44/01/06N 103/39/03W, 25-IX-2003, J & C Guenther; S Frk Rapid Cr, 23-VIII-2001 [BLAB].

*Remarks.*—The distribution of this relatively widespread North American baetid was reviewed by Meyer and McCafferty (2001).

***Fallceon quilleri*** (Dodds)

*Previous data.*—Moriyama and McCafferty (1979): FALL RIVER (Cherry Cr, Hot Brook). McCafferty (1990): FALL RIVER (Fall R, Hot Brook).

*New data.*—BUTTE: Redwater R at Jolly, 44/37/08N 103/49/12W, 13-VI-2004, D Gustafson; Redwater R at US 85, 8 km N Spearfish, 44/35/26N 103/51/38W, 24-IX-2003, J & C Guenther. CUSTER: Beaver Cr at St Rd 71, 3 km NW Buffalo Gap, 43/30/48N 103/19/36W, 26-IX-2003, J & C Guenther; Beaver Cr nr Pringle, 14-V-2003 [USGS]; Flynn Cr, 443.687, -103.475, 24-VIII-2001 [BLAB]. FALL RIVER: Cascade Springs at Cascade Falls St Rd 71, 16 km S Hot Springs, 43/19/18N 103/33/43W, 26-IX-2003, J & C Guenther; Cass Pig Cr, 43.337, -103.559, 25-VIII-2001 [BLAB]; Cheyenne R at St Rd 71, 19 km S Hot Springs, 43/18/20N 103/33/49W, 26-IX-2003, J & C Guenther. HAAKON: Cheyenne R at St Rd 34, 44/31/48N 101/55/38W, 7-VI-2000, P McCafferty et al. HARDING: Boxelder Cr at stateline, 45/56/43N 103/58/56W, 14-VI-2004, D Gustafson; Little Missouri R at Salmen Ford, 45/46/29N 103/53/16W, 14-VI-2004, D Gustafson. JONES: White R, Hwy 83 bridge, 43/42/36N 100/40/48W, 30-VII-2002, D Dockter [INHS]. LAWRENCE: Boxelder Cr, 23-VIII-2001 [BLAB]; Redwater R at US 85, 8 km N Spearfish, 44/35/26N 103/51/38W, 24-IX-2003, J & C Guenther; Whitewood Cr at US 85 in Deadwood, Super 8 Motel, 44/21/57N 103/43/57W, 24-IX-2003, J & C Guenther; Spear Cr, 44.417, -103.881, 22-VIII-2001 [BLAB]; Whitewood Cr at Whitewood Valley Rd, 10 km NW Sturgis, 44/28/25N 103/37/28W, 24-IX-2003, J & C Guenther (adult). MEADE: Belle Fourche R at St Rd 34, 6 km W Hereford, 44/30/47N 103/08/13W, 23-IX-2003, J & C Guenther. PENNINGTON: Palmer Gulch Cr, Keystone, 20-VI-1940, J Koss [INHS]. TODD:

Coffee Cr, 43.113, -101.107, 26-VIII-2001 [BLAB].

*Remarks.*—This is one of the most commonly encountered mayfly species in silt/sand bottomed streams of the plains regions of North America (e.g., McCafferty et al. 2001, 2003).

***Iswaeon anoka*** (Daggy)

*New data.*—LAWRENCE: Boxelder Cr at Co Rd 26, Vanocker Can Rd, 6 km SE Nemo, 44/09/12N 103/27/51W, 24-IX-2003, J & C Guenther. PENNINGTON: Spring Cr at US 385 and St Rd 244, 5 km SW Hill City, 43/53/35N 103/35/17W, 25-IX-2003, J & C Guenther.

*Remarks.*—*Iswaeon anoka*, n. comb., was formerly placed in the subgenus *Iswaeon* McCafferty and Webb of the genus *Heterocloeon* McDunnough by McCafferty et al. (2005). Its basal phylogenetic position and distinctiveness warrant the new status for *Iswaeon*, and by so doing we also recognize *Iswaeon davidi* (Waltz and McCafferty), n. comb. and *I. rubrolaterale* (McDunnough), n. comb. The previously known state and provincial distribution of this transcontinental species was treated by McCafferty et al. (2005, 2006), Guenther and McCafferty (2005), McCafferty (2006), and McCafferty and Meyer (2007).

***Paracloeodes minutus*** (Daggy)

*New data.*—FALL RIVER: Cheyenne R at St Rd 71, 19 km S Hot Springs, 43/18/20N 103/33/49W, 26-IX-2003, J & C Guenther. HAAKON: Cheyenne R at St Rd 34, 44/31/48N 101/55/38W, 1-VI-2000, P McCafferty et al. HARDING: Little Missouri R at Camp Crook, St Rd 20, 45/22/54N 103/58/16W, 7-VI-2000, P McCafferty et al.; Little Missouri R at Salmen Ford, 45/46/29N 103/53/16W, 14-VI-2004, D Gustafson. TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al.

*Remarks.*—This transcontinental species is found throughout much of North America (McCafferty and Meyer 2007).

***Plauditus dubius*** (Walsh)

*New data.*—TURNER: Vermillion R at St Rd 19, 3 km S Centerville, 43/05/19N 96/57/45W, 28-V-2003, P McCafferty et al.

*Remarks.*—This species ranges from Alaska (Randolph and McCafferty 2005), across Canada (McCafferty and Randolph 1998), and the central and eastern United States (e.g., Traver 1935, Faulkner and Tarter 1977, Randolph and McCafferty 1998, McCafferty et al. 2001, 2003, Chandler et al. 2006).

***Plauditus gloveri*** McCafferty and Waltz

*New data.*—GREGORY: Ponca Cr at unmarked Co Rd, ca 13 km SSE Burke, 43/03/28N 99/12/26W, 28-V-2003, P McCafferty et al. TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al.

*Remarks.*—This species is known from sparse records in central Canada (McCafferty et al. 2004, Webb et al. 2004) as well as certain central states such as South Dakota and Indiana (Jacobus and McCafferty 2006) and eastern states such as New York (Jacobus and McCafferty 2001a) and South Carolina (McCafferty and Waltz 1998).



***Plauditus punctiventris*** (McDunnough)

*New data.*—TODD: Antelope Cr at Hidden Timber Rd, 3 km NW Hidden Timber, 43/15/06N 100/28/16W, 29-V-2003, P McCafferty et al.

*Remarks.*—The exact range of this species is problematic because larvae were initially incorrectly associated with it [see discussion in McCafferty and Jacobus (2008)].

***Plauditus virilis*** (McDunnough)

*New data.*—UNION: Brule Cr, 2 km E Spink at St Rd 48, 42/51/04N 96/43/47W, 27-V-2003, P McCafferty et al.

*Remarks.*—This is one of the more commonly encountered, mainly eastern and central North American species of the genus *Plauditus* Lugo-Ortiz and McCafferty. It ranges as far west as Saskatchewan (McCafferty and Randolph 1998), Idaho (Lester et al. 2002), and Tamaulipas state in Mexico (Randolph and McCafferty 2000).

***Procloeon viridoculare*** (Berner)

*New data.*—HARDING: Boxelder Cr at stateline, 45/56/43N 103/58/56W, 14-VI-2004, D Gustafson; Little Missouri R at Salmen Ford, 45/46/29N 103/53/16W, 14-VI-2004, D Gustafson, MEADE: Cherry Cr at Avance Rd, 44/44/52N 102/16/48W, 7-VI-2000, P McCafferty et al. TRIPP: Keya Paha R at US Hwy 183, 2 km W Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al. UNION: Missouri R at 471<sup>st</sup> Ave, 10 km W Elk Point, 42/39/58N 96/47/11W, 26-IX-2003, J & C Guenther.

*Remarks.*—This species is relatively widespread in central and eastern North America and is one of the most common long-clawed baetids in central lowland states such as the Dakotas, Iowa, and Kansas (e.g., McCafferty et al. 2003, McCafferty and Jacobus 2008).

***Pseudocloeon dardanum*** (McDunnough)

*New data.*—CLAY: Vermillion R at 312<sup>th</sup> St, 9 km NNE Vermillion, 42/51/59N 96/53/48W, 28-V-2003, P McCafferty et al.; Vermillion R at St Rd 19, 23 km N Vermillion, 42/59/27N 96/57/48W, 28-V-2003, P McCafferty et al. GREGORY: Ponca Cr at unmarked Co Rd, ca 13 km SSE Burke, 43/03/28N 99/12/26W, 28-V-2003, P McCafferty et al. HAAKON: Cheyenne R at St Rd 34, 44/31/48N 101/55/38W, 7-VI-2000, P McCafferty et al.; West Plum Cr at St Rd 34, 44/24/03N 101/32/10W, 7-VI-2000, P McCafferty et al. HARDING: Little Missouri R at Camp Crook, St Rd 20, 45/22/54N 103/58/16W, 7-VI-2000, P McCafferty et al.; Little Missouri R at Salmen Ford, 45/46/29N 103/53/16W, 14-VI-2004, D Gustafson. TODD: Little White R at small unnamed bridge, Crazy Horse Canyon ca 5 km S Iron Shell Bridge, 43/12/07N 100/58/02W, 29-V-2003, P McCafferty et al. TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al. TURNER: Vermillion R at St Rd 19, 3 km S Centerville, 43/05/19N 96/57/45W, 28-V-2003, P McCafferty et al.

*Remarks.*—This common species of the genus was represented by two distinctive color morphs of larvae in North and South Dakota.

***Pseudocloeon frondale*** (McDunnough)

*Previous data.*—McCoy and Hales (1974): GRANT (N Fk Yellowbank R).

*Remarks.*—South Dakota and Texas (Wiersema 1998) constitute the westernmost known range limits of this species.

***Pseudocloeon propinquum*** (Walsh)

*Previous data.*—McCafferty and Kondratieff (1999): LAWRENCE (Little Spearfish Cr, Squaw Cr).

*New data.*—TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al.

*Remarks.*—*Pseudocloeon propinquum* and *P. dardanum* are common trans-continental species (McCafferty and Meyer 2007), and whereas *P. dardanum* was taken much more commonly in South Dakota than *P. propinquum*, the latter is generally more ubiquitous in North America.

## Baetiscidae

***Baetisca lacustris*** McDunnough

*Previous data.*—Pescador and Berner (1981): YANKTON (Missouri R).

*New data.*—CLAY: Vermillion R at 312<sup>th</sup> St, 9 km NNE Vermillion, 42/51/59N 96/53/48W, 28-V-2003, P McCafferty et al. TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al. TURNER: Vermillion R at St Rd 19, 3 km S Centerville, 43/05/19N 96/57/45W, 28-V-2003, P McCafferty.

*Remarks.*—This most widespread species of the North American genus *Baetisca* Walsh (e.g., Lester et al. 2002, McCafferty and Meyer 2007), is often the only one found in parts of the upper plains of the United States (McCafferty et al. 2001, Guenther and McCafferty 2005).

## Caenidae

***Brachycercus harrisella*** Curtis, 1834

*New data.*—TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al.

*Remarks.*—This is the most broadly distributed species of Caenidae, being common in Asia, Europe and North America (Sun and McCafferty 2008).

***Caenis amica*** Hagen

*Previous data.*—McCafferty (1990): PENNINGTON (Rapid City). Provonsha (1990): PENNINGTON (Rapid City).

*New data.*—BUTTE: Redwater R at Jolly, 44/37/08N 103/49/12W, 13-VI-2004, D Gustafson. CODINGTON: Big Sioux R at US 212, Watertown, 44/53/20N 97/04/49W, 22-IX-2003, J & C Guenther. MEADE: Cherry Cr at Avance Rd, 44/44/52N 102/16/48W, 7-VI-2000, P McCafferty et al. (adult). LAWRENCE: Horsethief Lk, Black Hills, 20-VI-1940, J Ross [INHS]. TURNER: Vermillion R at St Rd 19, 3 km S Centerville, 43/05/19N 96/57/45W, 28-V-2003, P McCafferty et al.

*Remarks.*—This species has been reported from nearly every U. S. state and lower province of Canada (e.g., Provonsha 1990).

***Caenis hilaris*** (Say)

*New data.*—MOODY: Big Sioux R at Co Rd B, 6 km E of I-29, 16 km SE Brookings, 44/09/09N 96/41/13W, 22-IX-2003, J & C Guenther.

*Remarks.*—North and South Dakota, Nebraska and Kansas (Provonsha 1990), Oklahoma (Traver 1935), Texas (Wiersema and McCafferty 1999), and Saskatchewan (Webb et al. 2004) constitute the westernmost known range limits of this species.

***Caenis latipennis*** Banks

*Previous data.*—McCafferty and Kondratieff (1999): HARDING (Little Missouri R).

*New data.*—BROWN: Elm R, 2 km W Ordway, nr bridge, 45/34/12N 98/25/59W, 28-VII-2002, D Dockter [INHS]; Elm R, 4 km NW Westport, below dam, 45/40/12N 98/32/24W, 28-VII-2002, D Dockter [INHS]. CHARLES MIX: Lake Wagner at Wagner, 43/05/03N 98/18/18W, 28-V-2003, P McCafferty et al. CORSON: Grand R at St Rd 65, 45/41/17N 101/20/20W, 6-VIII-2004, J & C Guenther; Grand R, Standing Rock Reservation, 46/41/36N 101/21/38W, 20-VII-2004 [VCSU]; DEWEY: Moreau R at St Rd 63, 45/10/53N 101/12/15W, 6-VIII-2004, J & C Guenther. FAULK: N Fork Snake Cr at St Rd 20, 2 km SW Cresbard, 45/09/29N 98/57/55W, 22-IX-2003, J & C Guenther. GRANT: S Fork Yellowbank R at US Hwy 77 bridge, 1 km N US Hwy 77 and US Hwy 20 jct, 13-V-1978 [SCUK]. GREGORY: Ponca Cr at unmarked Co Rd, ca 13 km SSE Burke, 43/03/28N 99/12/26W, 28-V-2003, P McCafferty et al. HAAKON: Cheyenne R at St Rd 34, 44/31/48N 101/55/38W, 7-VI-2000, P McCafferty et al.; West Plum Cr at St Rd 34, 44/24/03N 101/32/10W, 7-VI-2000, P McCafferty et al. HAMLIN: Stray Horse Cr at I29, 13 km SE Watertown, 44/47/17N 96/56/31W, 22-IX-2003, J & C Guenther. HANSON: Johnson Cr at 258<sup>th</sup> St, 43/38/41N 97/52/30W, 6-VIII-2004, J & C Guenther. HARDING: Boxelder Cr at stateline, 45/56/43N 103/58/56W, 14-VI-2004, D Gustafson; Little Missouri R at Camp Crook, St Rd 20, 45/22/54N 103/58/16W, 7-VI-2000, P McCafferty et al.; Little Missouri R at Salmen Ford, 45/46/29N 103/53/16W, 14-VI-2004, D Gustafson. JONES: White R, Hwy 83 bridge, 43/42/36N 100/40/48W, 30-VII-2002, D Dockter [INHS]. MEADE: Cherry Cr at Avance Rd, 44/44/52N 102/16/48W, 7-VI-2000, P McCafferty et al. MELLETTTE: Blackpipe Cr at St Rd 63, 5 km N Corn Cr, 43/35/39N 101/11/36W, 29-V-2003, P McCafferty et al. PERKINS: Grand R at St Rd 73, 45/45/39N 102/10/35W, 6-VIII-2004, J & C Guenther. SPINK: Snake Cr at St Rd 20, 8 km W Northville, 54/09/31N 98/39/01W, 22-IX-2003, J & C Guenther; Turtle Cr at US 212 in Redfield, Turtle Cr Watershed Project Site, 44/53/20N 97/04/49W, 22-IX-2003, J & C Guenther (larva & adult). STANLEY: Fort Pierre at light, 6-VI-2000, P McCafferty et al. (adult). TODD: Antelope Cr at Hidden Timber Rd, 3 km NW Hidden Timber, 43/15/06N 100/28/16W, 29-V-2003, P McCafferty et al. TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al.; Owl Cr at Rd to Ideal, 2 km E US Hwy 183, 43/32/37N 100/00/58W, 6-VI-2000, P McCafferty et al. UNION: Brule Cr at Co Rd C1, W Union Grove St Prk, 42/55/20N 96/47/07W, 27-V-2003, P McCafferty et al.; E Union Cr at St Rd 48, 12 km E Spink, 42/51/05N 96/35/49W, 27-V-2003, P McCafferty et al.

*Remarks.*—This is the most ubiquitous species of *Caenis* Stephens in North America and is by far the most common *Caenis* in the Dakotas (Guenther and McCafferty 2005).

***Caenis tardata*** McDunnough

*New data.*—BROWN: Elm R, 4 km NW Westport, below dam, 45/40/12N 98/32/24W, 28-VII-2002, D Dockter [INHS].

*Remarks.*—Although a transcontinental species (McCafferty and Meyer 2007), this species is known from scattered localities mainly in the northern half of the continent (e.g., Provonsha 1990).

***Caenis youngi*** Roemhild

*New data.*—STANLEY: Fort Pierre at light, VI-6-2000, P McCafferty et al. (adult).

*Remarks.*—This species is known from throughout Canada and from the central regions of the United States (e.g., Provonsha 1990). In the Dakotas, it is much more common in North Dakota (Guenther and McCafferty 2005) than it is in South Dakota.

***Cercobrachys cree*** Sun, Webb, and McCafferty

*New data.*—CORSON: Little Missouri R at Schettler Ranch, 31-VII-2003, K McDermott [VCSU]. HAAKON: Cheyenne R at Four Corners Rd, 13 km SE St Rd 34, 44/31/13N 101/59/29W, 23-IX-2003, J & C Guenther. MEADE: Belle Fourche R at St Rd 34, 6 km W Hereford, 44/30/47N 103/08/13W, 23-IX-2003, J & C Guenther. TRIPP, Keya Paha R at US Hwy 183, 1 mi N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al. ZIEBACH: Cheyenne R at Four Corners Rd, 13 km SE St Rd 34, 44/31/13N 101/59/29W, 23-IX-2003, J & C Guenther.

*Remarks.*—Besides South Dakota, this species is also known from North Dakota (Guenther and McCafferty 2005), the plains of Montana, Saskatchewan, and Alberta (Sun et al. 2002, Sun and McCafferty 2008). Larvae were collected in slow flowing water and silty substrates near stream shorelines.

***Cercobrachys fox*** Sun and McCafferty

*New data.*—CORSON: Grand R, Standing Rock Reservation, 45/44/29N 101/00/26W, 11-VIII-2004 [VCSU].

*Remarks.*—This species is also known from Indiana, Iowa, Nebraska, North Dakota, and Wisconsin (Guenther and McCafferty 2005, Sun and McCafferty 2008). In Iowa, it was recorded as *C. sp. 1* by McCafferty et al. (2003), whereas *C. sp. 2* in Iowa (McCafferty et al. 2003) refers to *C. winnebago* Sun and McCafferty (Sun and McCafferty 2008); in Nebraska, *C. fox* was recorded as *C. serpentis* Soldán by McCafferty et al. (2001); and in North Dakota, it was recorded as *C. sp. A* by Guenther and McCafferty (2005).

***Susperatus prudens*** (McDunnough)

*New data.*—MEADE: Belle Fourche R at St Rd 34, 6 km W Hereford, 44/30/47N 103/08/13W, 23-IX-2003, J & C Guenther.

*Remarks.*—This species is known from parts of the intermountain West as well as central prairie regions of Canada and the United States (Sun and McCafferty 2008).

## Ephemerellidae

*Drunella doddsii* (Needham)

*Previous data.*—McCafferty and Kondratieff (1999): LAWRENCE (Spearfish Cr).

*Remarks.*—Far western South Dakota (Black Hills) constitutes the eastern-most range limit of this common western species.

*Ephemerella dorothea* Needham

*New data.*—LAWRENCE: Spearfish, 27-VII-1940, T & T Frison [INHS].

*Remarks.*—The Black Hills of South Dakota represent the easternmost range of the western subspecies *E. d. infrequens* McDunnough, whereas the eastern adjoining state of Minnesota represents the westernmost range of the eastern subspecies *E. d. dorothea* Needham (Krueger and Martin 1980).

*Ephemerella excrucians* Walsh

*Previous data.*—Allen and Edmunds (1965) as *E. inermis*: LAWRENCE (Spearfish Cr); PENNINGTON (Rapid Cr). McCafferty (1990) as *E. inermis*: CUSTER (Beaver Cr); LAWRENCE (Boxelder Cr, Jim Cr); PENNINGTON (Rapid Cr).

*New data.*—BUTTE: Redwater R at Jolly, 44/37/08N 103/49/12W, 13-VI-2004, D Gustafson. CUSTER: Beaver Cr nr Pringle, 14-V-2003 [USGS]; Highland Cr above Madison Outcrop, 13-V-2003 [USGS]. LAWRENCE: Spearfish Cr at Savoy, 44/20/60N 103/55/23W, 13-VI-2004, D Gustafson. PENNINGTON: Rapid Cr at 32<sup>nd</sup> St in Rapid City off St Rd 44, 44/04/05N 103/16/16W, 29-V-2003, P McCafferty et al.; Rapid Cr at Mystic Rd, FR 231, 4 km N Mystic, 44/06/14N 103/39/10W, 25-IX-2003, J & C Guenther. TODD: Little White R at small unnamed bridge, Crazy Horse Canyon ca 5 km S Iron Shell Bridge, 43/12/07N 100/58/02W, 29-V-2003, P McCafferty et al.

*Remarks.*—This is a widespread, transcontinental species previously known also as *E. inermis* in the West (Jacobus and McCafferty 2003).

## Ephemeridae

*Ephemera simulans* Walker

*New data.*—LAWRENCE: Boxelder Cr at Co Rd 26, Vanocker Can Rd, 6 km SE Nemo, 44/09/12N 103/27/51W, 24-IX-2003, J & C Guenther.

*Remarks.*—This is the most widespread and common North American species of the genus *Ephemera* Linn., and although a South Dakota distribution was shown for this species by McCafferty (1975), data associated or original source were not found.

*Hexagenia bilineata* (Say)

*Previous data.*—Swanson (1967): BON HOMME (Missouri R); YANKTON (Missouri R).

*New data.*—BROWN: Elm R, 2 km W Ordway, nr bridge, 45/34/12N 98/25/59W, VII-28-2002, D Dockter [INHS].

*Remarks.*—This widespread species (McCafferty 1975) is the major burrowing mayfly of our larger rivers in North America (see e.g., Fremling 1960), including the Missouri River in the plains region of the United States.

***Hexagenia limbata*** (Serville)

*Previous data.*—Swanson (1967): BON HOMME (Missouri R); YANKTON (Missouri R). McCafferty and Kondratieff (1999): BRULE (Missouri R).

*New data.*—CLAY: Vermillion R at 312 St, 9 km NNE Vermillion, 42/51/59N 96/53/48W, 28-V-2003, P McCafferty et al.; Vermillion R at St Rd 19, 23 km N Vermillion, 42/59/27N 96/57/48W, 28-V-2003, P McCafferty et al. CORSON: Grand R, Standing Rock Reservation, 45/40/32N 101/41/48W, 30-IX-2003 [VCSU]. MCCOOK: E Fork Vermillion R at Hawk Dr, 6 km W Humboldt, 43/39/07N 97/10/24W, 6-VIII-2004, J & C Guenther. MEADE: Cherry Cr at Avance Rd, 44/44/52N 102/16/48W, 7-VI-2000, P McCafferty et al. MOODY: Big Sioux R at Co Rd B, 6 km E I-29, 16 km SE Brookings, 44/09/09N 96/41/13W, 22-IX-2003, J & C Guenther. TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al. TURNER: Vermillion R at St Rd 19, 3 km S Centerville, 43/05/19N 96/57/45W, 28-V-2003, P McCafferty et al.

*Remarks.*—This is the most widespread species of burrowing mayflies in North America (McCafferty 1975), and is often a major benthic invertebrate in lakes and small to medium sized streams.

## Heptageniidae

***Ecdyonurus criddlei*** (McDunnough)

*Previous data.*—McCafferty (1990): CUSTER (French Cr).

*Remarks.*—Far western South Dakota (Black Hills) constitutes the easternmost known range limit of this species.

***Epeorus longimanus*** (Eaton)

*Previous data.*—McCafferty (1990) as *E. grandis* (McDunnough): LAWRENCE (Iron Cr, Spearfish Cr); PENNINGTON (Grizzly Bear Cr, Rapid Cr). McCafferty and Kondratieff (1999): LAWRENCE (Jim Cr, stream in Jenny Gulch); PENNINGTON (Burnt Fk).

*New data.*—LAWRENCE: Spearfish Cr at Savoy, 44/20/60N 103/55/23W, 13-VI-2004, D Gustafson; Spearfish Cr at Hellsgate Gulch, 44/16/46N 103/54/02W, 13-VI-2004, D Gustafson.

*Remarks.*—Far western South Dakota (Black Hills) and possibly Manitoba (Whiting and Sheard 1990) constitute the easternmost known range limits of *E. longimanus*.

***Heptagenia elegantula*** (Eaton)

*Previous data.*—McCafferty and Kondratieff (1999) as *H. diabasia* Burks: BRULE (Missouri R).

*New data.*—CLAY: Vermillion R at St Rd 19, 23 km N Vermillion, 42/59/27N 96/57/48W, 28-V-2003, P McCafferty et al. CUSTER: Battle Cr at St Rd 79, 1 km S Hermosa, 43/50/03N 103/11/56W, 26-IX-2003, J & C Guenther. GRANT: S Fork Yellowbank R at US Hwy 77 bridge, 1 km N US Hwy 77 and US Hwy 20 jct, 13-V-1978 [SCUK]. GREGORY: Ponca Cr at unmarked Co Rd, ca 13 km SSE Burke, 43/03/28N 99/12/26W, 28-V-2003, P McCafferty et al. HAAKON: Cheyenne R at St Rd 34, 44/31/48N 101/55/38W, 7-VI-2000, P McCafferty et al. HARDING: Little Missouri R at Camp Crook, St Rd 20, 45/22/54N 103/58/16W,

7-VI-2000, P McCafferty et al.; Little Missouri R at Salmen Ford, 45/46/29N 103/53/16W, 14-VI-2004, D Gustafson. MELLETTE: Blackpipe Cr at St Rd 63, 5 km N Corn Creek, 43/35/39N 101/11/36W, 29-V-2003, P McCafferty et al. TODD: Antelope Cr at Hidden Timber Rd, 3 km NW Hidden Valley, 43/15/06N 100/28/16W, 29-V-2003, P McCafferty et al.; Little White R at small unnamed bridge, Crazy Horse Canyon ca 5 km S Iron Shell Bridge, 43/12/07N 100/58/02W, 29-V-2003, P McCafferty et al. TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al. TURNER: Vermillion R at St Rd 19, 3 km S Centerville, 43/05/19N 96/57/45W, 28-V-2003, P McCafferty et al. UNION: Brule Cr, 2 km E Spink at St Rd 48, 42/51/04N 96/43/47W, 27-V-2003, P McCafferty et al.; Brule Cr at Co Rd C1, W Union Grove St Prk, 42/55/20N 96/47/07W, 27-V-2003, P McCafferty et al.; E Union Cr at St Rd 48, 12 km E Spink, 42/51/05N 96/35/49W, 27-V-2003, P McCafferty et al.

*Remarks.*—This species was traditionally known as a mainly western species; however, with the discovery of the equivalency with *H. diabasia* Burks, Webb et al. (2007) showed it to be a somewhat polytypic transcontinental species.

***Heptagenia flavescens*** (Walsh)

*New data.*—CLAY: Vermillion R at 312<sup>th</sup> St, 9 km NNE Vermillion, 42/51/59N 96/53/48W, 28-V-2003, P McCafferty et al. TURNER: Vermillion R at St Rd 19, 3 km S Centerville, 43/05/19N 96/57/45W, 28-V-2003, P McCafferty et al. UNION: Missouri R at 471<sup>st</sup> Ave, 10 km W Elk Point, 42/39/58N 96/47/11W, 26-IX-2003, J & C Guenther.

*Remarks.*—This species is a common, mainly large river species ranging from the east coast of North America, across Canada and through the midwestern states, where in the North it finds its westernmost range limit in the Dakotas (Guenther and McCafferty 2005).

***Heptagenia pulla*** (Clemens)

*New data.*—TRIPP: Keya Paha R at US Hwy 183, 2 km W Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al.

*Remarks.*—This species is found across Canada (e.g., McCafferty and Randolph 1998), and in the United States finds its westernmost limits in South Dakota.

***Leucrocota hebe*** (McDunnough)

*New data.*—HARDING: Boxelder Cr, 45/56/43N 103/58/56W, 14-VI-2004, D Gustafson; Little Missouri R at Salmen Ford, 45/46/29N, 103/53/16W, 14-VI-2004, D Gustafson.

*Remarks.*—This is primarily an eastern species, ranging as far west as Alberta in Canada (Jacobus and McCafferty 2001b) and the plains regions of the central United States (McCafferty et al. 2001, Guenther and McCafferty 2005).

***Leucrocota maculipennis*** (Walsh)

*Previous data.*—McCafferty and Kondratieff (1999): BUTTE (Belle Fourche R); HARDING (Little Missouri R).

*New data.*—CLAY: Vermillion R at 312<sup>th</sup> St, 9 km NNE Vermillion, 42/51/59N 96/53/48W, 28-V-2003, P McCafferty et al.; Vermillion R at St Rd 19, 23 km

N Vermillion, 42/59/27N 96/57/48W, 28-V-2003, P McCafferty et al. CORSON: Grand R, Standing Rock Reservation, 45/41/02N 101/20/20W, 21-VII-2004 [VCSU]; Grand R, Standing Rock Reservation, 45/44/29N 101/00/26W, 11-VIII-2004 [VCSU]. HAAKON: Cheyenne R at St Rd 34, 44/31/48N 101/55/38W, 7-VI-2000, P McCafferty et al.; W Plum Cr at St Rd 34, 44/24/03N 101/32/10W, 7-VI-2000, P McCafferty et al. HARDING: Little Missouri R at Camp Crook, St Rd 20, 45/22/54N 103/58/16W, 7-VI-2000, P McCafferty et al.; Little Missouri R at Salmen Ford, 45/46/29N 103/53/16W, 14-VI-2004, D Gustafson. MEADE: Cherry Cr at Avance Rd, 44/44/52N 102/16/48W, 7-VI-2000, P McCafferty et al.

Remarks.—This is a common eastern species that ranges to the Northwest Territory and Alberta in Canada (Cobb and Flannagan 1980, Webb and McCafferty 2003), and the central plains region of the United States (e.g., Wilhm et al. 1978, Henry 1986, McCafferty et al. 2001, 2003, Guenther and McCafferty 2005).

***Maccaffertium exiguum*** (Traver)

*New data.*—TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al.

*Remarks.*—In addition to South Dakota, North Dakota (Guenther and McCafferty 2005), Nebraska (McCafferty et al. 2001), Kansas (Liechti 1978a), Oklahoma (Baumgardner and Kennedy 1999), and Texas (Wiersema and McCafferty 1999) constitute the westernmost known range limits of this eastern species (Bednarik and McCafferty 1979).

***Maccaffertium mediopunctatum*** (McDunnough)

*Previous data.*—Bednarik and McCafferty (1979): GRANT (Yellowbank R).

*New data.*—GRANT: S Fork Yellowbank R at US Hwy 77 bridge, 1 km N US Hwy 77 and US Hwy 20 jct, 13-V-1978 [SCUK].

*Remarks.*—In addition to South Dakota, Kansas (Liechti 1978a), Oklahoma (Bednarik and McCafferty 1979), and Texas (Lugo-Ortiz and McCafferty 1995b) constitute the westernmost known range limits of this species.

***Maccaffertium mexicanum*** (Ulmer)

*New data.*—CLAY: Vermillion R at St Rd 19, 23 km N Vermillion, 42/59/27N 96/57/48W, 28-V-2003, P McCafferty et al. HANSON: James R at 416<sup>th</sup> Ave, 8 km W Alexandria, 43/38/38N 97/53/12W, 6-VIII-2004, J & C Guenther. HUTCHINSON: James R at US Hwy 18, E Olivet Riverside Prk, 43/14/23N 97/40/04W, 28-V-2003, P McCafferty et al. TURNER: Vermillion R at St Rd 19, 3 km S Centerville, 43/05/19N 96/57/45W, 28-V-2003, P McCafferty et al. UNION: Missouri R at 471<sup>st</sup> Ave, 10 km W Elk Point, 42/39/58N 96/47/11W, 26-IX-2003, J & C Guenther.

*Remarks.*—Besides South Dakota, North Dakota (Guenther and McCafferty 2005), Nebraska (McCafferty et al. 2001), Kansas (Liechti 1978a), Oklahoma (Baumgardner and Kennedy 1999), Texas (Wiersema and McCafferty 1999), and Tamaulipas (Bednarik and McCafferty 1979) constitute the westernmost known range limits of this species.



***Maccaffertium terminatum*** (Walsh)

*New data.*—CLAY: Vermillion R at 312<sup>th</sup> St, 9 km NNE Vermillion, 42/51/59N 96/53/48W, 28-V-2003, P McCafferty et al.; Vermillion R at St Rd 19, 23 km N Vermillion, 42/59/27N 96/57/48W, 28-V-2003, P McCafferty et al. CORSON: Grand R, Standing Rock Reservation, 46/41/36N 101/21/38W, 14-IX-2004 [VCSU]. HARDING: Little Missouri R at Camp Crook, St Rd 20, 45/22/54N 103/58/16W, 7-VI-2000, P McCafferty et al. TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al. TURNER: Vermillion R at St Rd 19, 3 km S Centerville, 43/05/19N 96/57/45W, 28-V-2003, P McCafferty et al. UNION: Brule Cr, 2 km E Spink at St Rd 48, 42/51/04N 96/43/47W, 27-V-2003, P McCafferty et al.; Brule Cr at Co Rd C1, W Union Grove St Prk, 42/55/20N 96/47/07W, 27-V-2003, P McCafferty et al.

*Remarks.*—This is the most widespread species of *Maccaffertium* Bednarik, and the only one with a transcontinental distribution (Bednarik and McCafferty 1979).

***Stenacron interpunctatum*** (Say)

*Previous data.*—McCafferty and Kondratieff (1999): PENNINGTON (Rapid Cr).

*New data.*—BROWN: Elm R, 4 km NW Westport, below dam, 45/40/12N 98/32/24W, 28-VII-2002, D Dockter [INHS]. CODINGTON: Big Sioux R at US 212, Menards in Watertown, 44/53/20N 97/04/49W, 22-IX-2003, J & C Guenther. CUSTER: Battle Cr at St Rd 79, 1 km S Hermosa, 43/50/03N 103/11/56W, 26-IX-2003, J & C Guenther. HUTCHINSON: St James R at US Hwy 18, E Olivet Riverside Prk, 43/14/23N 97/40/04W, 28-V-2003, P McCafferty et al. UNION: Brule Cr at Co Rd C1, W Union Grove St Prk, 42/55/20N 96/47/07W, 27-V-2003, P McCafferty et al.; E Union Cr at St Rd 48, 12 km E Spink, 42/51/05N 96/35/49W, 27-V-2003, P McCafferty et al.

*Remarks.*—Besides South Dakota, North Dakota (Guenther and McCafferty 2005), Nebraska (McCafferty et al. 2001), Kansas (Gray 1989), Oklahoma (Lewis 1974), Texas (Campbell and Clark 1982), and Alberta (Barton 1980) constitute the westernmost known range limits of this common and ubiquitous, mainly eastern species.

## Isonychiidae

***Isonychia bicolor*** (Walker)

*New data.*—HUTCHINSON: James R at US Hwy 18, E Olivet Riverside Prk, 43/14/23N 97/40/04W, 28-V-2003, P McCafferty et al.

*Remarks.*—Besides South Dakota, North Dakota (Guenther and McCafferty 2005), Nebraska (McCafferty et al. 2001), and Oklahoma (McCafferty et al. 1997b) constitute the westernmost known distributional limits of this common eastern North American species.

***Isonychia rufa*** McDunnough

*Previous data.*—Kondratieff and Voshell (1984): MINNEHAHA (Sioux Falls).

*New data.*—CORSON: Grand R, Standing Rock Reservation, 45/44/23N 101/14/49W, 14-IX-2004 [VCSU]. HARDING: Little Missouri R at Salmen Ford,

45/46/29N 103/53/16W, 14-VI-2004, D Gustafson. TURNER: Vermillion R at St Rd 19, 3 km S Centerville, 43/05/19N 96/57/45W, 28-V-2003, P McCafferty et al.

*Remarks.*—This is another common, mainly eastern species (Kondratieff and Voshell (1984) that in the northern United States, finds its westernmost range in South Dakota and North Dakota (Guenther and McCafferty 2005).

#### Leptoxyphidae

##### *Tricorythodes explicatus* (Eaton)

*Previous data.*—McCafferty (1990) as *T. minutus* Traver: CUSTER (French Cr); FALL RIVER (Cheyenne R, Fall R); LAWRENCE (Boxelder Cr); PENNINGTON (Grizzly Bear Cr).

*New data.*—BUTTE: Redwater R at Jolly, 44/37/08N 103/49/12W, 13-VI-2004, D Gustafson. CORSON: Grand R, Standing Rock Reservation, 45/36/07N 101/47/29W, 11-VIII-2003 [VCSU]. CUSTER: Beaver Cr nr Pringle, 24-VII-2003 [USGS]. HAAKON: Cheyenne R at St Rd 34, 2 km SW Bridger, 44/31/43N 101/55/47W, 23-IX-2003, J & C Guenther. HARDING: Little Missouri R at Salmen Ford, 45/46/28N 103/53/16W, 14-VI-2004, D Gustafson. LAWRENCE: Boxelder Cr at Co Rd 26, Vanocker Can Rd, 44/11/47N 103/30/11W, 24-IX-2003, J & C Guenther. MEADE: Belle Fourche R at St Rd 34, 6 km W Hereford, 44/30/47N 103/08/13W, 23-IX-2003, J & C Guenther. MOODY: Big Sioux R at Co Rd B, 6 km E I-29, 16 km SE Brookings, 44/09/09N 96/41/13W, 22-IX-2003, J & C Guenther. PENNINGTON: Spring Cr at US 385 and St Rd 244, 5 km SW Hill City, 43/53/35N 103/35/17W, 25-IX-2003, J & C Guenther (adult). TODD: Antelope Cr at Hidden Timber Rd, 3 km NW Hidden Timber, 43/15/06N 100/28/16W, 29-V-2003, P McCafferty et al. (adult). ZIEBACH: Cheyenne R at St Rd 34, 2 km SW Bridger, 44/31/43N 101/55/47W, 23-IX-2003, J & C Guenther.

*Remarks.*—This is a common, primarily western North American species. In the East it may have been confused with other species of the genus, particularly if records were based on larvae. North Dakota (Guenther and McCafferty 2005) and South Dakota apparently represent the northeastern limits of its more continuous western North American range.

##### *Tricorythodes fictus* Traver, 1935

*New data.*—PENNINGTON: Spring Cr at US 385 and St Rd 244, 5 km SW of Hill City, 43/53/35N 103/35/17W, 25-IX-2003, J & C Guenther.

*Remarks.*—South Dakota represents the northernmost known state of record for this species, which is also known from Oklahoma (Traver 1935), Nebraska (McCafferty et al 2001), and Texas (Baumgardner et al. 2003).

#### Leptophlebiidae

##### *Leptophlebia nebulosa* (Walker)

*Previous data.*—McCafferty and Kondratieff (1999): FALL RIVER (Cheyenne R). Burian (2001): LAWRENCE (Iron Cr).

*Remarks.*—This species is widespread in North America except for the Southwest.

***Neochoroterpes oklahoma*** (Traver)

*New data.*—BUTTE: Redwater R at US 85, 8 km N Spearfish, 44/35/26N 103/51/38W, 24-IX-2003, J & C Guenther. FALL RIVER: Cheyenne R at St Rd 71, 19 km S Hot Springs, 43/18/20N 103/33/49W, 26-IX-2003, J & C Guenther. HAAKON: Cheyenne R at Four Corners Rd, 13 km SE St Rd 34, 44/31/13N 101/59/29W, 23-IX-2003, J & C Guenther; Cheyenne R at St Rd 34, 44/31/48N 101/55/38W, 7-VI-2000, P McCafferty et al.; Cheyenne R at St Rd 34, 2 km SW Bridger, 44/31/43N 101/55/47W, 23-IX-2003, J & C Guenther. HARDING: Little Missouri R at Camp Crook, St Rd 20, 45/22/54N 103/58/16W, 7-VI-2000, P McCafferty et al.; Little Missouri R at Salmen Ford, 45/46/29N 103/53/16W, 14-VI-2004, D Gustafson. LAWRENCE: Redwater R at US 85, 8 km N Spearfish, 44/35/26N 103/51/38W, 24-IX-2003, J & C Guenther. MEADE: Belle Fourche R at St Rd 34, 6 km W Hereford, 44/30/47N 103/08/13W, 23-IX-2003, J & C Guenther; Cherry Cr at Avance Rd, 44/44/52N 102/16/48W, 7-VI-2000, P McCafferty et al. ZIEBACH: Cheyenne R at Four Corners Rd, 13 km SE St Rd 34, 44/31/13N 101/59/29W, 23-IX-2003, J & C Guenther; Cheyenne R at St Rd 34, 2 km SW Bridger, 44/31/43N 101/55/47W, 23-IX-2003, J & C Guenther.

*Remarks.*—North Dakota (Guenther and McCafferty 2005) represents the northernmost distribution limit of this mainly south-central North American species. It is relatively well represented in the western half of South Dakota.

***Paraleptophlebia adoptiva*** (McDunnough)

*New data.*—LAWRENCE: Boxelder Cr at Co Rd 26, Vanocker Can Rd, Nemo, 44/11/47N 103/30/11W, 24-IX-2003, J & C Guenther; Spearfish, 27-VII-1940, T Frison, T Frison Jr [INHS]. PENNINGTON: Castle Cr at Mystic Rd, Co Rd C218 in Mystic, 7 km W Silver City, 44/04/35N 103/38/31W, 25-IX-2003, J & C Guenther; Rapid Cr at Mystic Rd, FR 231, 4 km N Mystic, 44/06/14N 103/39/10W, 25-IX-2003, J & C Guenther.

*Remarks.*—This mainly eastern species has also been reported centrally from Oklahoma (Baumgardner and Kennedy 1999), and as far west as Montana (Linduska 1942) and British Columbia (Wigle and Thommasen 1990).

***Paraleptophlebia debilis*** (Walker)

*Previous data.*—McCafferty and Kondratieff (1999): PENNINGTON (Rapid Cr).

*Remarks.*—This transcontinental species (McCafferty and Meyer 2007) is the most widespread of the North American *Paraleptophlebia* Lestage species.

***Paraleptophlebia memorialis*** (Eaton)

*Previous data.*—McCafferty and Kondratieff (1999): CUSTER (Iron Cr); PENNINGTON (Rapid Cr, stream in Sunday Gulch).

*Remarks.*—South Dakota constitutes the easternmost known range limit of this western North American species.

***Paraleptophlebia mollis*** (Eaton)

*Previous data.*—McCafferty (1990): LAWRENCE (Boxelder Cr, Jim Cr); PENNINGTON (Grizzly Bear Cr, Rapid Cr).

*Remarks.*—Western South Dakota constitutes the westernmost known distributional limits of this eastern North American species.

***Traverella albertana*** (McDunnough)

*New data.*—CORSON: Grand R, Standing Rock Reservation, 45/36/07N 101/47/29W, 11-VIII-2003 [VCSU].

*Remarks.*—North Dakota (Guenther and McCafferty 2005) and South Dakota constitute the easternmost known range limits of *T. albertana* north of Mexico. It is, however, widespread throughout Mexico (Randolph and McCafferty 2000).

## Oligoneuriidae

***Homoeoneuria alleni*** Pescador and Peters,

*New data.*—LINCOLN: Big Sioux R, NE Canton, N bridge Rt 126, 43/19/27N 96/31/44W, VIII-10-2003, D Dockter [INHS]; TODD: Coffee Cr, 43.113, -101.107 26-VIII-2001, C Hawkins [BLAB, initially identified as *H. ammophila* (Spieth)]. TRIPP: Keya Paha R, 2 km N Wewela, Bridge Hwy 183, 43/01/39N 99/46/52W, VIII-10-2003, D Dockter [INHS].

*Remarks.*—This species is common to the Missouri River drainage system of the Great Plains, including as far east as western Iowa (McCafferty et al. 2006).

## Palingeniidae

***Pentagenia vittigera*** (Walsh)

*Previous data.*—Swanson (1967): BON HOMME (Missouri R); YANKTON (Missouri R).

*Remarks.*—South Dakota, Nebraska (McCafferty et al. 2001), Kansas (Tucker 1907), and Texas (Eaton 1883) constitute the westernmost known range limits of this species.

## Polymitarcyidae

***Ephoron album*** (Say)

*New data.*—CORSON: Grand R, Standing Rock Reservation, 45/44/29N 101/37/23W, 28-VII-2004 [VCSU]. DEWEY: Moreau R at St Rd 63, 45/10/53N 101/12/15W, 6-VIII-2004, J & C Guenther. HARDING: Little Missouri R at Camp Crook, St Rd 20, 46/22/54N 103/58/16W, 7-VI-2000, P McCafferty et al.; Little Missouri R at Salmen Ford, 45/46/29N 103/53/16W, 14-VI-2004, D Gustafson.

*Remarks.*—This is a transcontinental species associated with a variety of burrowing substrates (e.g., McCafferty 1975). The eastern species *E. leukon* Williamson occurs as far west as North Dakota (Guenther and McCafferty 2005), and may eventually be found in South Dakota.

## Potamanthidae

***Anthopotamus myops*** (Walsh)

*New data.*—CLAY: Vermillion R at St Rd 19, 23 km N Vermillion, 42/59/27N 96/57/48W, 28-V-2003, P McCafferty et al. MOODY: Big Sioux R at Co Rd B, 6 km E I-29, 16 km SE Brookings, 44/09/09N 96/41/13W, 22-IX-2003, J & C Guenther; Fiand R, 44.074, -96.465, 28-VIII-2001, C Hawkins [BLAB]. TURNER: Vermillion R at St Rd 19, 3 km S Centerville, 43/05/19N 96/57/45W, 28-V-2003, P McCafferty et al.

*Remarks.*—Besides South Dakota, North Dakota, Kansas (Bae and McCafferty 1991), and Oklahoma (Baumgardner and Kennedy 1999) constitute the westernmost known distribution limits of this eastern species.

#### Pseudironidae

##### *Pseudiron centralis* McDunnough

*New data.*—TODD: Little White R at small unnamed bridge, Crazy Horse Canyon ca 5 km S Iron Shell Bridge, 43/12/07N 100/58/02W, 29-V-2003, P McCafferty et al. TRIPP: Keya Paha R at US Hwy 183, 2 km N Wewela, 43/01/38N 99/46/50W, 29-V-2003, P McCafferty et al.

*Remarks.*—This psammophilous species occurs from the east coast to the Intermountain West in North America.

#### Siphonuridae

##### *Siphonurus columbianus* McDunnough

*Previous data.*—McCafferty (1990): PENNINGTON (Grizzly Bear Cr).

*Remarks.*—Western South Dakota and Nebraska (McCafferty et al. 2001) constitute the easternmost known range limits of this western species.

##### *Siphonurus occidentalis* (Eaton)

*Previous data.*—McCafferty and Kondratieff (1999): CUSTER (stream entering Sylvan Lk).

*New data.*—LAWRENCE: Horsethief Lk, Black Hills, 20-VI-1940, J Ross [INHS]; Spearfish, 27-VII-1940, T Frison, T Frison Jr [INHS]. PENNINGTON: Palmer Gulch Cr, Keystone, 20-VI-1940, J Ross [INHS].

*Remarks.*—South Dakota, Nebraska (McCafferty et al. 2001), and Kansas (Liechti 1983) constitute the easternmost known distribution limits of this species.

#### ACKNOWLEDGMENTS

We extend our gratitude for assistance with this study to Andre DeLorme (Valley City State University), Dawn Dockter (University of Illinois), Cameron Guenther (Grand Rapids, Michigan), Dan Gustafson (Montana State University), Colin Favert (Illinois Natural History Survey), Scott Grotheer (USGS, Denver), Luke Jacobus (Indiana University), Arwin Provonsha (Purdue University), Mark Vinson (Utah State University), and Jeff Webb (LaTrobe University, Albury, Australia). Support was provided by NSF grant DEB-9901577 to WPM.

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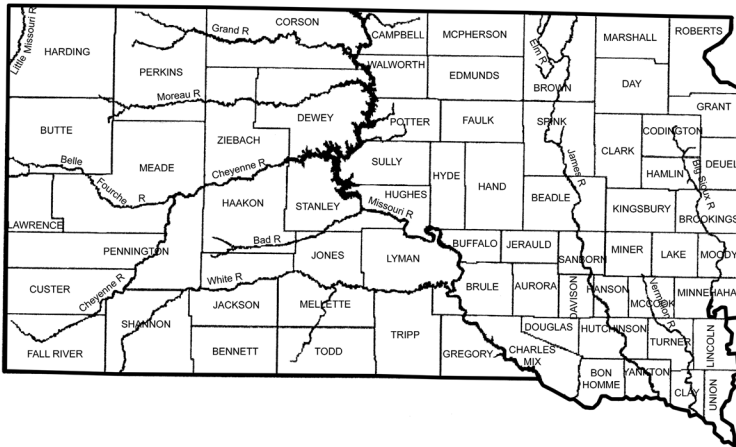


FIGURE 1. South Dakota counties and major waterways.