

# North Dakota vascular plants: manual to the Polygonaceae

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## Contents

Main Key . . . . .	1
<i>Eriogonum</i> Michaux, wild buckweat . . . . .	3
<i>Fagopyrum</i> Mill., buckweat . . . . .	4
<i>Fallopia</i> Adans., false buckweat . . . . .	5
<i>Persicaria</i> (L.) Mill., smartweed . . . . .	6
<i>Polygonum</i> L., knotweed . . . . .	8
<i>Rumex</i> L., dock . . . . .	9

Keys are compiled from multiple sources, mainly from the “Flora of North America” and Lesica’s (2012) “Manual of Montana Vascular Plants”.

## Main Key

1. Ocreae absent; nodes not swollen; flowers usually enclosed in involucre or subtended by involucre bracts . . . . . *Eriogonum*
  - Ocreae present, persistent or deciduous; nodes usually swollen; flowers not enclosed in involucre or associated with involucre bracts . . . . . 2.
2. Tepals 6 . . . . . 3.
  - Tepals 3, 4, or 5 . . . . . 4.
3. Inner tepals of fruiting perianths non-acrescent; achenes winged; stamens (6–)9 . . . . . *Rheum*  
(*Rheum rhabarbarum*)
  - Inner tepals of fruiting perianths usually accrescent, large and hide the achene; achenes without prominent wings; stamens 6 . . . . . *Rumex*
- 4 (2). Outer tepals winged or keeled . . . . . 5.
  - Outer tepals unwinged and unkeeled . . . . . 6.
5. Outer tepals winged (usually just keeled in *Fallopia convolvulus*); ocreae chartaceous, tan to brownish, glabrous or scabrous to variously pubescent, never 2-lobed distally . . . . . *Fallopia*
  - Outer tepals keeled; ocreae often hyaline, silvery, glabrous, 2-lobed distally . . . . . *Polygonum* (in part)
- 6 (4). Leaves mostly basal, some cauline; inflorescences terminal, spikelike (sometimes bearing pyriform, pink to brown or purple bulblets); stems simple . . . . . *Bistorta*  
(*Bistorta vivipara*)

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- Leaves cauline; inflorescences terminal and axillary or axillary; stems usually branched, rarely simple ..... 7.
  - 7. Achenes strongly exserted; perianths non-acrescent; tepals distinct ..... *Fagopyrum*
  - Achenes included or exserted; perianths accrescent or nonaccrescent; tepals connate to 2/3 their lengths ..... 8.
  - 8 (7). Ocreae often hyaline, silvery, glabrous, 2-lobed distally, often disintegrating into fibers or completely. Flowers frequently axillary ..... *Polygonum* (in part)
  - Ocreae chartaceous, usually tan, brown, or reddish, rarely silvery, glabrous or scabrous to variously pubescent, never 2-lobed distally, often tearing with age. Inflorescences spikelike, paniclelike, or capitate ..... *Persicaria*

**Eriogonum Michaux, wild buckweat**

- 1. Plants annual or biennial, without a branched caudex ..... 2.
- Plants perennial with a woody, branched caudex ..... 6.
- 2. Flowering stems scapose ..... 3.
- Flowering stems leafy ..... 5.
- 3. Leaf blades variously glabrous or hirsute on one or both surfaces ..... 4.
- Leaf blades densely tomentose to floccose-tomentose or floccose on one or both surfaces .....  
..... *Eriogonum cernuum*
- 4. Perianths glabrous ..... *Eriogonum gordonii*
- Perianths pubescent ..... *Eriogonum trichopes*
- 5 (2). Leaves glabrous to sparsely villous ..... *Eriogonum visheri*
- Leaves tomentose ..... *Eriogonum annuum*
- 6 (1). Perianth with a tubular base not less than 1 mm long that appears to be a continuation of the  
pedicel. Some leaves usually more than 5 mm wide; flowers bright yellow ... *Eriogonum flavum*
- Perianth with a mostly rounded base ..... 7.
- 7. Inflorescence open ..... *Eriogonum brevicaule* (USDA: *Eriogonum lagopus*)
- Inflorescence capitate, perianth white or pink ..... *Eriogonum pauciflorum*

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***Fagopyrum* Mill., buckweat**

Both species are cultivated and occasionally “escaped”.

1. Achene faces smooth, angles smooth; tepals 3–5 mm; perianths, creamy white to pale pink; inflorescences paniclelike, 1–4 cm, terminal and axillary . . . . . *Fagopyrum esculentum*
- Achene faces irregularly rugose, angles often sinuate-dentate; tepals 1.5–3 mm; perianths, green with whitish margins; inflorescences racemelike, 2–10 cm, axillary . . . . . *Fagopyrum tataricum*

**Fallopia Adans., false buckweat**

This genus is still frequently treated as a part of *Polygonum*.

1. Achenes minutely granular-tuberculate, dull; fruiting perianths glabrous or with blunt, hyaline hairs, wings absent or, rarely, 0.4–0.9 mm wide; plants annual .....  
 ..... *Fallopia convolvulus* (USDA: *Polygonum convolvulus*)
- Achenes smooth, shiny; fruiting perianths glabrous, wings 1.5–2.1 mm wide; plants perennial or annual ..... 2.
- 2 (1). Plants perennial or annual; fruiting perianth wings decurrent on stipelike base, undulate or crinkled, rarely flat, margins wavy-crenulate to incised or lacerate, rarely entire .....  
 ..... *Fallopia scandens* (USDA: *Polygonum scandens*)
- Plants annual; fruiting perianth wings usually truncate to attenuate-decurrent on stipelike base, flat or, less often, undulate or crinkled, margins entire or rarely undulate-crenate .....  
 ..... *Fallopia dumetorum* (USDA: *Polygonum dumetorum*)

Might be found in North Dakota.

**Persicaria (L.) Mill., smartweed**

This genus is still frequently treated as a part of *Polygonum*.

1. Stems with recurved prickles, scandent or, rarely, ascending to erect. Peduncles usually glabrous, sometimes with retrorse prickles proximally; leaves petiolate; bases of leaf blades sagittate to cordate; stamens 8 . . . . . *Persicaria sagittata* (USDA: *Polygonum sagittatum*)
- Stems unarmed, usually erect or ascending, rarely prostrate or decumbent . . . . . 2.
2. Some or all ocreae foliaceous and green distally. Plants perennial; rhizomes or stolons usually present; leaf blades ovate-lanceolate to elliptic or oblong-lanceolate, 1–6(–8) cm wide . . . . .  
. . . . . *Persicaria amphibia* (in part) (USDA: *Polygonum amphibium*)
- All ocreae chartaceous and hyaline, tan, brown, or reddish brown throughout, never foliaceous and green distally . . . . . 3.
- 3 (2). Perianths glandular-punctate . . . . . 4.
- Perianths not glandular-punctate . . . . . 7.
4. Achenes minutely roughened, dull; axillary inflorescences sometimes enclosed in ocreae . . . . .  
. . . . . *Persicaria hydropiper* (USDA: *Polygonum hydropiper*)
- Achenes smooth, shiny; inflorescences never enclosed in ocreae . . . . . 5.
5. Outer tepals with anchor-shaped veins; achenes discoid . . . . .  
. . . . . *Persicaria lapathifolia* (in part) (USDA: *Polygonum lapathifolium*)
- Outer tepals without anchor-shaped veins; achenes 3-gonous or biconvex . . . . . 6.
6. Punctae confined to bases of perianths and sometimes on inner tepals . . . . .  
. . . . . *Persicaria hydropiperoides* (in part) (USDA: *Polygonum hydropiperoides*)
- Punctae more or less uniformly distributed over perianths. Inflorescences interrupted; ocreolae (ocreae on inflorescences) mostly not overlapping, margins mostly ciliate with hairs to 2 mm; leaf blades 0.6–2.4 cm wide . . . . . *Persicaria punctata* (USDA: *Polygonum punctatum*)
- 7 (3). Peduncles stipitate-glandular . . . . . 8.
- Peduncles not stipitate-glandular . . . . . 10.
8. Plants perennial; rhizomes or stolons usually present; inflorescences terminal . . . . .  
. . . . . *Persicaria amphibia* (in part) (USDA: *Polygonum amphibium*)
- Plants annual; rhizomes and stolons absent; inflorescences terminal and axillary . . . . . 9.
9. Outer tepals with anchor-shaped veins; tepals 4(–5); inflorescences mostly arching or nodding . . . . .  
. . . . . *Persicaria lapathifolia* (in part) (USDA: *Polygonum lapathifolium*)
- Outer tepals without anchor-shaped veins; tepals 5; inflorescences erect or, rarely, nodding . . . . .  
. . . . . *Persicaria pensylvanica* (in part) (USDA: *Polygonum pensylvanicum*)
- 10 (7). Plants perennial; rhizomes or stolons usually present . . . . . 11.
- Plants annual; rhizomes and stolons absent . . . . . 12.
11. Achenes biconvex; styles 2. Perianth roseate to red; surfaces of ocreae glabrous or appressed-pubescent to hirsute, not glandular-punctate . . . . .  
. . . . . *Persicaria amphibia* (in part) (USDA: *Polygonum amphibium*)
- Achenes 3-gonous; styles 3 . . . . .  
. . . . . *Persicaria hydropiperoides* (in part) (USDA: *Polygonum hydropiperoides*)
- 12 (10). Margins of ocreae without bristles or with bristles to 1 mm; ocreolae (ocreae on inflorescences) mostly overlapping; achenes discoid, rarely trigonous . . . . . 13.

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- Margins of ocreae ciliate with bristles 0.2–1.3(–2) mm, if bristles less than 1 mm then ocreolae not overlapping; achenes discoid, biconvex, or 3-gonous; styles 2–3. . . . .  
. . . . . *Persicaria maculosa* (USDA: *Polygonum persicaria*)
  - 13. Outer tepals with anchor-shaped veins; tepals 4(–5); inflorescences mostly arching or nodding  
. . . . . *Persicaria lapathifolia* (in part) (USDA: *Polygonum lapathifolium*)
  - Outer tepals without anchor-shaped veins; tepals 5; inflorescences mostly erect, rarely nodding  
. . . . . *Persicaria pensylvanica* (in part) (USDA: *Polygonum pensylvanicum*)

**Polygonum L., knotweed**

Summer fruits are often distinct from the fall fruits.

1. Stems distinctly and more or less regularly 8–16-ribbed; leaf blade venation pinnate, secondary veins conspicuous; anthers whitish yellow; nearly worldwide ..... 2.  
(*Polygonum aviculare* s.l.)  
One may not proceed further, it is enough to accept all species under this these as *Polygonum aviculare* s.l. (in broad sense).
  - Stems tetragonous, ribs obscure or absent; leaf blade venation parallel, secondary veins not conspicuous; anthers pink to purple ..... 11.
2. Leaves in distal part of inflorescence reduced, not overtopping flowers (shorter than or equaling flowers); inflorescences axillary and terminal, spikelike ..... 3.
  - Leaves in distal part of inflorescence overtopping flowers; inflorescences entirely axillary ..... 4.
3. Achenes striate-tubercled ..... *Polygonum patulum*  
Might be found in North Dakota.
  - Achenes smooth or roughened. Margins of tepals greenish yellow or yellow, rarely pink or white; achenes 2.5–3.5 mm ..... *Polygonum ramosissimum* (USDA: *Polygonum bellardii*, *Polygonum leptocarpum*) (in part)
- 4 (2). Achenes striate-tubercled, uniformly tubercled, or obscurely tubercled ..... 5.
  - Achenes smooth to roughened ..... 10.
5. Plants green to bluish green; margins of tepals white, pink, or red ..... 6.
  - Plants light green or yellowish; margins of tepals green to yellow ..... 8.
6. Achenes coarsely striate-tubercled ..... *Polygonum aviculare* (USDA: *Polygonum arenastrum*, *Polygonum buxiforme*) (in part)
  - Achenes obscurely tubercled ..... 7.
7. Plants dark brown to black after drying; distal part of ocreae dis-integrating into persistent fibers, brown ..... *Polygonum ramosissimum* (USDA: *Polygonum bellardii*, *Polygonum leptocarpum*) (in part)
  - Plants green after drying (sometimes whitish from powdery mildew); distal part of ocreae persistent, silvery ..... *Polygonum aviculare* (USDA: *Polygonum arenastrum*, *Polygonum buxiforme*) (in part)
- 8 (5). Perianth tube 40–55% of perianth length; tepals more or less keeled; pedicels 1.3–1.8 mm, enclosed in ocreae ..... *Polygonum achoreum*
  - Perianth tube 20–38% of perianth length; tepals not keeled; pedicels 2–7 mm, exerted from ocreae ..... 9.
9. Leaf blades elliptic to obovate; distal parts of ocreae more or less persistent, silvery; achenes striate-tubercled ..... *Polygonum erectum*
  - Leaf blades narrowly elliptic to lanceolate, rarely ovate; distal parts of ocreae soon disintegrating into persistent brown fibers; achenes uniformly tubercled ..... *Polygonum ramosissimum* (USDA: *Polygonum bellardii*, *Polygonum leptocarpum*) (in part)
- 10 (4). Perianth tube 40–57% of perianth length ..... *Polygonum aviculare* (USDA: *Polygonum arenastrum*, *Polygonum buxiforme*) (in part)
  - Perianth tube 18–38% of perianth length; plants heterophyllous; cymes crowded toward tips of branches ..... *Polygonum ramosissimum* (USDA: *Polygonum bellardii*, *Polygonum leptocarpum*) (in part)
- 11 (1). Ocreae 5–12 mm; perianths and achenes 3–5 mm; flowers closed; pedicels 2–6 mm; perianth tubes 20–28% of perianth lengths ..... *Polygonum douglasii*
  - Ocreae 3–5 mm; perianths and achenes 1.2–2.6 mm; leaf blades with 1 pleat on each side of midrib ..... *Polygonum tenue*



**Rumex L., dock**

1. Flowers mostly unisexual; pedicels articulated near base of tepals; outer tepals normally angled towards inner tepals; inner tepals not enlarged or slightly enlarged, normally 1–3 mm, equaling to slightly wider than achenes; tubercles absent; leaf blades obovate-oblong, ovate-lanceolate, lanceolate-elliptic, or lanceolate (rarely linear-lanceolate), base hastate or at least broadly cuneate (almost truncate) ..... *Rumex acetosella*
- Flowers normally bisexual, sometimes bisexual and unisexual within same inflorescence; leaf blades never hastate or sagittate; pedicels with or without evident articulation ..... 2.
- 2 (1). Plants not developing basal rosette of leaves (this is hard to observe in the end of season); stems erect, ascending, procumbent, or decumbent, normally with regular, leafy axillary shoots tending to develop second-order axillary inflorescences (often overtopping first-order ones); leaf blades mostly lanceolate, elliptic, ovate, ovate-lanceolate, or ovate-elliptic, base cuneate or almost rounded, or in some species broadly cuneate; inner tepal margins entire (rarely in some species minutely erose-denticulate) ..... 3.
- Plants developing basal rosette of leaves (sometimes, especially in annual species, not persistent at maturity); stems mostly erect, sometimes ascending, spreading, or almost prostrate, simple or several from base, not branching below terminal paniculate inflorescence, without axillary shoots; leaf blades variable in shape, base cordate to cuneate; inner tepal margins entire or variously dentate ..... 6.
3. Inner tepals 20–30 mm wide ..... *Rumex venosus*
- Inner tepals normally less than 15 mm wide ..... 4.
4. Pedicels approximately 3–5 times as long as inner tepals, articulated in proximal part. Leaf blades mostly linear-lanceolate, 5–10 times as long as wide, thin; inflorescences normally interrupted (at least in basal 2); inner tepals longer than wide, or rarely as long as wide .....  
..... *Rumex verticillatus*
- Pedicels usually not more than 2–2.5 times as long as inner tepals, articulated near middle or in proximal 2 ..... 5.
5. Leaf blades ovate-lanceolate or elliptic-lanceolate, distinctly widest in proximal 1/2; inner tepals usually 4.5–6 mm, broadly triangular; tubercles (2–)3; stems normally erect, rarely ascending .....  
..... *Rumex altissimus*
- Leaf blades in most cases lanceolate or linear-lanceolate, usually widest near middle; inner tepals 2–3 mm; tubercle 1; stems erect or ascending ..... *Rumex salicifolius*
- 6 (2). Inner tepals with tubercles absent (or one inner tepal with indistinct tubercle or slightly thickened midvein), margins entire, indistinctly erose or, rarely, minutely denticulate ..... 7.
- Inner tepals with at least 1 distinct tubercle, margins entire, denticulate, or variously dentate ..... 9.
7. Pedicels with distinctly swollen articulation point ..... 8.
- Pedicels without swollen articulation point. Leaf blades ovate-triangular, ovate-lanceolate, or oblong-lanceolate, base distinctly to weakly cordate, occasionally rounded or truncate; inflorescences normally with comparatively long branches more than 7–8 cm .....  
..... *Rumex occidentalis* (USDA: *Rumex aquaticus*)
8. Leaf blades 15–30 × 1–4 cm, base narrowly cuneate; inner tepals 3–5 mm wide; achenes usually reddish brown, less than 1–1.5 mm wide ..... *Rumex pseudonatronatus* (in part)  
Might be found in North Dakota.
- Leaf blades 25–60 × 7–15 cm, base broadly cuneate, rounded-truncate, or slightly cordate; inner tepals 4.5–7.5 mm wide; achenes dark brown or brown, normally 1.5–2 mm wide .....  
..... *Rumex longifolius* (in part)

- 9 (6). Inner tepals with margins entire or minutely and indistinctly erose-denticulate (teeth less than 0.2 mm); however, in *Rumex stenophyllus* often more distinctly dentate, then inner tepals reniform, orbiculate, broadly ovate, or broadly ovate-triangular (approximately as long as wide, or wider than long), base often cordate ..... 10.
- Inner tepal margins variously dentate (at least some teeth 0.3 mm or longer, almost always evidently longer than wide (excluding teeth), base variable but normally not cordate ..... 16.
10. Inner tepal margins denticulate or dentate, at least proximally, normally less than 6 mm, with three equal or subequal tubercles ..... *Rumex stenophyllus*
- Inner tepals normally more than 6 mm, with 1 distinct tubercle, other inner tepals without tubercles or tubercles small ..... 11.
11. Inner tepals with 1 indistinct tubercle less than 1(–1.3) mm, or some with tubercles absent (usually both types occur within same inflorescence) ..... 12.
- Inner tepals normally with 3 tubercles, or at least with 1 distinct tubercle more than (1–)1.5 mm wide ..... 13.
12. Leaf blades 15–30 × 1–4 cm, base narrowly cuneate; inner tepals usually 3–5 mm wide; achenes reddish brown, usually 1–1.5 mm wide ..... *Rumex pseudonatronatus* (in part)  
 Might be found in North Dakota.
- Leaf blades 25–60 × 7–15 cm, base broadly cuneate; inner tepals 4.5–7.5 mm wide; achenes brown to dark brown, normally 1.5–2 mm wide ..... *Rumex longifolius* (in part)
- 13 (11). Inner tepals with 3 distinctly equal or subequal tubercles; leaf blades 20–70 cm, lanceolate or oblong-lanceolate, base cuneate, occasionally or rounded or truncate .....  
 ..... *Rumex britannica* (USDA: *Rumex orbiculatus*)
- Inner tepals with 1 tubercle, or with 3 unequal tubercles, at least 1 tubercle distinctly larger; leaf blades variable (rarely tubercles subequal, then largest leaves smaller than 55 cm) ..... 14.
14. Leaf blades broadly ovate, ovate-triangular, or ovate-elliptic, base deeply and broadly cordate, apex obtuse to subacute; tubercle usually 1 ..... *Rumex confertus*
- Leaf blades ovate-lanceolate, oblong-lanceolate, or lanceolate, base cuneate, truncate, or subcordate, apex acute or subacute; tubercles 1–3 ..... 15.
15. Leaf blades ovate-lanceolate or oblong-lanceolate, margins flat or weakly undulate; inner tepals 5–10 mm, broadly ovate to orbiculate, base usually distinctly cordate; tubercles normally 1 (occasionally 2–3); stems usually 80–150 cm ..... *Rumex patientia*
- Leaf blades usually lanceolate, margins strongly undulate and crisped; inner tepals 3.5–6 mm, orbiculate-ovate or ovate-deltoid, base truncate, or subcordate; tubercles normally 3 (rarely 1–2); stems usually 40–100 cm ..... *Rumex crispus*
- 16 (9). Leaf blades 7–25 cm, lanceolate-linear or lanceolate (rarely oblong-lanceolate), at least four times as long as wide; inner tepal margins with long bristlelike or subulate-filiform teeth longer than or equaling width of inner tepals (very rarely teeth shorter, or even absent); inner tepals (excluding teeth) narrowly triangular or narrowly rhombic-triangular, normally approximately 2 times as long as wide; plants annual (less commonly biennial or short-lived perennial) .....  
 ..... *Rumex maritimus*
- Leaf blades 20–40 cm, ovate, obovate to elongate, occasionally broadly oblong-lanceolate, less than 4 times as long as wide; inner tepal margins with short-subulate or triangular-subulate (not bristlelike) teeth equaling or shorter than width of inner tepals; inner tepals (excluding teeth) usually deltoid or broadly triangular (occasionally ligulate) normally approximately 1.5–2 times as long as wide; plants annual, biennial, or perennial ..... *Rumex obtusifolius*