

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE SPECIFICATION GUIDE SHEET

STREAM HABITAT IMPROVEMENT AND MANAGEMENT
(ac.)
CODE 395

GENERAL CRITERIA

Stream habitat improvements and management will be based on a watershed assessment and an assessment of current stream and riparian conditions. There are several models and evaluation tools that may be used. These are identified in Table 1.

An assessment will be completed regarding impacts to any threatened, endangered, or special concern species identified by federal, state, or Tribal governments. Use current South Dakota Procedures contained in Section II of the South Dakota Technical Guide (SDTG).

Measures will be planned to avoid spawning periods or other key periods for fish species inhabiting the stream. Contact a NRCS biologist to obtain current available fisheries population information for the stream, including but not limited to the species composition of the fish community, current management issues, and identified management goals. Refer to Table 2 for key information regarding habitat requirements, spawning dates, and related information for the fish species that occupy the stream.

Additional criteria to provide channel morphology and riparian characteristics important to desired aquatic species.

The species or group of species for which habitat is being managed and/or developed will be identified on the SD-CPA-26, and specific habitat features and management will be documented on the form as appropriate. Specific habitat requirements, habitat models, or other habitat information for targeted species will be obtained from a SD NRCS biologist.

REFERENCES

- Bureau of Land Management 1993. Process for Assessing Proper Functioning Condition. Technical Reference 1737-9. US Dept. Interior. Denver, CO. 51 pp.
- Churchill, E. P., and W. H. Over 1938. Fishes of South Dakota. 87 pp.
- Morris, J., L. Morris, and L. Witt. 1974. The fishes of Nebraska. Nebraska Game and Parks Commission, Lincoln, NE. 98 pp.
- Neumann, Robert M., and David W. Willis. 1994. Guide to the common fishes of South Dakota. South Dakota Dept. of Game Fish and Parks and Dept of Wildlife and Fisheries Sciences, South Dakota State University. 60 pp.

Table 1. Stream corridor assessment methods.

Abbreviated label	Full title of assessment method	Key reference locations for South Dakota
HGM	Hydrogeomorphic wetland functional assessment models for riverine systems	SDTG Section 1. Resource Assessment Tools - Wetlands
SVAP	Stream Visual Assessment Protocol	SDTG, Section 1. Resource Assessment Tools - Biology
PFC IBI	Proper Functioning Condition Index of Biotic Integrity	Bureau of Land Management 1993 SDGF&P

Table 2. Summary of key information regarding fish species found in South Dakota for locations and timing of stream habitat management and improvement measures.				
SPECIES	SPAWNING	HABITAT	CONCERNS/NOTES	STATUS
Pallid sturgeon <i>Scaphirhynchus albus</i>	June thru August	Bottom dweller of large, turbid streams and rivers with strong currents; with firm sand or gravel bottoms	Missouri River dams block normal movement; alter water quality, temperature and flow patterns, as well as reducing spawning habitat.	FE, SE
Banded killifish <i>Fundulus diaphanus</i>	Late spring and summer with egg clusters attaching to plants by filaments	Ranges from quiet waters of lakes and ponds with lots of vegetation to muddy streams without vegetation	Reduced habitat due to wetland drainage; known in Charles Mix, Day, and Deuel Counties; specifically known in Lake Cochrane, North and South Waubay Lakes, and Lake Andes and streams within one mile of those lakes	SE
Pearl dace <i>Margariscus margarita</i>	Spring in clear water in mid to lesser current over sand or gravel	Occurs in cool bog ponds, lakes, springs, creeks, and clear streams	Limited suitable habitat in SD; known only in Bennett, Todd, and Tripp Counties; specifically known in Keya Paha River and its perennial tributaries; Elm and Lake Creeks (Bennett); Coffee Creek (Todd); and Little White River and its perennial tributaries	ST
Central mudminnow <i>Umbra limi</i>	May or June	Found in heavily vegetated parts of small creek pools, where the bottom has thick layer of "muck"	Habitats subject to drainage or alteration, densely vegetated streams and creeks; known in Brookings, Day, Deuel, and Roberts Counties; specifically in Owens Creek, and Six Mile Creek, and streams within one mile of Lake Cochrane and Blue Dog Lake and in those lakes	SE
Sturgeon chub <i>Hybopsis gelida</i>	Late spring to midsummer	Prefers swift current areas of channels of large, silty rivers, usually over gravel bottoms	Habitat loss due to river impoundments, decreased turbidity below dams in the Missouri, White, Cheyenne, Grand, and Little Missouri Rivers. Currently known in Bennett, Custer, Fall River, Haakon, Jackson, Jones, Lyman, Meade, Mellette, Pennington, Shannon, Todd, Tripp, and Ziebach Counties; specifically within Cheyenne River and White River and their perennial tributaries	ST

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Sicklefin chub <i>Hybopsis meeki</i>	Spring	Found in main channels of large turbid rivers in areas of strong current over sand or fine gravel	Habitat loss from upriver impoundment and decreased turbidity below dams; found in the Missouri River below Ft. Randall Dam or its tributary entrances	ST
Longnose sucker <i>Catostomus catostomus</i>	Usually from April to mid-May	Cool, spring-fed creeks where it feeds on the bottom on algae, crustaceans, snails, and insect larvae	Mining, logging and other activities near streams that affect water quality and temperature, found in the Black Hills area; known in Butte and Lawrence Counties; specifically known in Redwater Creek, Spearfish Creek, and Crow Creek	ST
Plains topminnow <i>Fundulus sciadicus</i>	May and June	Clear, slow-moving streams with aquatic vegetation, quiet pools of small creeks and backwaters, and overflow pools of larger streams	May be indicator of stream water quality in areas of the Vermillion, James, Cheyenne and Missouri River drainages; found in Bennett, Bon Homme, Davison, Fall River, Hanson, Hutchinson, Sanborn, Todd, and Tripp Counties	
Trout-perch <i>Percopsis omiscomaycus</i>	Spring to late summer	Lakes and turbid streams; a nocturnal species feeding over shallow bottoms on insect larvae and amphipods	Lakes and streams of the Big Sioux River drainages; found in Brookings, Codington, Grant, Hamlin, Lincoln, Minnehaha, Moody, and Union Counties; specifically known in the Big Sioux River and Lake Kampeska (Codington)	ST
Northern redbelly dace <i>Phoxinus eos</i>	Late spring thru summer mats of algae or aquatic plants; eggs hatch in 8–10 days	Boggy lakes, creeks, and ponds; often found in tea-colored, slightly acid water; feeding on algae, zooplankton, and immature aquatic insects	Adverse impacts to spring-fed streams of the Big Sioux, Minnesota, Niobrara, and Crow Creek drainages; found in Bennett, Brookings, Deuel, Grant, Todd, and Tripp Counties; specifically known in Keya Paha River and its perennial tributaries, Lake, Six Mile, and Deer Creeks (Brookings), Monighan Creek (Deuel), Gary Creek (Deuel), North Fork Yellow Bank River (Grant), and South Fork Yellow Bank River (Deuel and Grant)	ST

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Finescale dace <i>Phoxinus neogaeus</i>	April to June under logs and debris with eggs hatching in and days	Bog ponds, streams, and lakes; often in association with the northern red belly dace, with which it may hybridize; feeds on insects, crustaceans, and plankton	Suitable cool spring-fed stream habitat is rare in SD; found in Fall River, Lawrence, and Todd Counties; specifically known in Fall River, Coffee Creek, Cox Lake, Mud Lake, Mirror Lake, and Redwater Creek	ST
Paddlefish <i>Polyodon spathula</i>	Early spring spawner over gravel bars during high water	Prefers large, free flowing rivers rich in zooplankton, but frequents impoundments with access to spawning sites	Habitat loss and over-fishing; Missouri River dams which prevent upstream spawning migrations	Special concern
Blacknose shiner <i>Notropis heterolepis</i>	June	Cool weedy streams and lakes; eats small aquatic insects, crustaceans, and algae	An important indicator of high water quality and pristine streams; it is a host fish of the freshwater mussel, the cylindrical papershell; known in Tripp and Todd Counties in Keya Paha River and its perennial tributaries	SE
Topeka shiner <i>Notropis topeka</i>	Mid-June through August; in pool habitats over orangespotted and green sunfish nests	Pools of spring-fed prairie streams in eastern South Dakota; feeding primarily on invertebrates midges, mayflies, copepods, and waterfleas	James, Big Sioux, and Vermillion River Watersheds;	FE
Freshwater drum <i>Aplodinotus grunniens</i>	Spring when water temps are 66 to 72 degrees Fahrenheit	Rivers, natural lakes, and reservoirs where it feeds along the bottom on immature insects, crayfish, fish, and mollusks; in SD, primarily in the Missouri River and its tributaries	Bottom feeding fish species	

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SPECIES	SPAWNING	HABITAT	CONCERNS/NOTES	STATUS
Sauger <i>Stizostedion canadense</i>	Early spring when water temps are 41 to 45 degrees Fahrenheit; at night in backwaters or tributaries on gravel or rock substrate	Large, often turbid, free-flowing streams, lakes, rivers, and impoundments feeding primarily on fish, crayfish, and other crustaceans and insects; habitat is similar to that of walleye, except sauger are more tolerant of high turbidity and strong current	Important SD sport fish found primarily in the Missouri River system; can interbreed with walleye resulting in "saugeye"	
Walleye <i>Stizostedion vitreum</i>	Spawn when water temps reach about 45 degrees Fahrenheit; eggs are distributed over rock and gravel	Large streams, rivers, and lakes, generally in moderately deep (to 50 feet) waters; fry eat zooplankton and aquatic insects, juveniles and adults feed primarily on fish, but aquatic invertebrates, particularly mayfly larvae and crayfish, seasonally important	State fish of SD; annually propagated where natural reproduction is lacking; largest member of perch family	
Yellow perch <i>Perca flavescens</i>	May and June when water temperature is between 45 and 55 degrees Fahrenheit; long, gelatinous, tubular egg masses are deposited in shallow areas over submerged vegetation or other natural material, such as rocks, sand or gravel	Fresh and (rarely) brackish waters including ponds, lakes, and reservoirs; adaptable species most common in clear, open water with moderate vegetation; fry feed on zooplankton; juveniles on shrimp scud, crustaceans, and midge larva; adults on small fishes, aquatic insects, and small crayfish	Reproduction and subsequent population levels are extremely inconsistent in many of the state's larger wind-swept waters because of high turbidity, wave action, and lack of vegetation	
Johnny darter <i>Etheostoma nigrum</i>	May to June when water temps are between 53 and 75 degrees Fahrenheit; in shallow parts of streams in pools or runs and edges of ponds and lakes under various debris where the eggs are guarded by the male until they hatch	In eastern SD, it is found primarily in small creeks and rivers; prefers clear water with sandy or gravelly bottoms and slow or still waters, but do ok in moderately turbid, moving water over silt and vegetation; it primarily lives on the bottom; young feed on small copepods and waterfleas; as they get larger, they feed on invertebrates including midge, mayfly and caddisfly larvae and tiny crustaceans	Has no special status in SD; it plays an important role in aquatic food chains; they are eaten by many predatory fish that share their habitat, including smallmouth bass, walleyes, and yellow perch; it is fed upon by fish eating birds; it does not have a swim bladder, and it must rely only on swimming power, current, and wave action for mobility; it lives on the bottom and feeds on small invertebrates, rarely exceeding three inches	

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Logperch <i>Percina caprodes</i>	June over sand and gravel	Primarily found in the Big Sioux River drainage; habitats range from small creeks to rivers, lakes, and reservoirs; it prefers clean riffles over sand and gravel; they overturn small rocks in search for food, which consists of small invertebrates	Siltation and other detrimental effects have caused their numbers to decline sharply in some areas; early in life, the logperch feeds on the surface, but as it matures, it becomes a bottom feeder; the logperch is eaten by birds, like terns and mergansers, and by larger fish like largemouth bass, northern pike, walleyes, and rock bass	
Black crappie <i>Pomoxis nigromaculatus</i>	May or June in <10' with water temps between 61 and 79 degrees Fahrenheit; male sweeps out a nest in sand or fine gravel in colony at sheltered near shore areas; usually near vegetation beds or plant roots; male guards nest and defends young until they start to feed	Clear waters of large streams and medium-sized lakes, and aquatic vegetation over bottom of sand, muck, or aquatic debris; prefers cleaner, deeper, cooler waters than white crappie; inhabits heavily vegetated, shallow waters in spring, moving in summer to roam or suspend over deep water; initial diet is zooplankton, supplemented with insects toward the end of first year; feeds on small fish and minnows from second year on	Black crappie may not have been native to SD (originally only the eastern United States), but they have been introduced into natural lakes and impoundments throughout SD; like the white crappie it feeds on zooplankton, insects, and fish; it is more likely to be found in clearer waters than the white crappie	
White crappie <i>Pomoxis annularis</i>	Late May to early July, when water temps are about 61 to 68 degrees Fahrenheit, in <20 feet of water; male scrapes out a nest on gravel, hard clay, sand or vegetation swept clean of debris and silt in colony; male guards nest until young hatch and start to feed	Clear waters of large streams and medium-sized lakes, and aquatic vegetation over bottom of sand, muck, or aquatic debris; more likely to be found in more turbid (muddy) water than black crappie; inhabits heavily vegetated, shallow waters in spring, moving in summer to roam or suspend over deep water; initial diet is zooplankton, supplemented with insects toward the end of first year; feeds on small fish and minnows from second year on	White crappie are native to extreme northeastern SD, and has been stocked throughout the state; it may compete with walleye to some degree because of similar habits; both travel open water in schools, feeding on similar foods at night, dawn, and dusk	

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Orange-spotted sunfish <i>Lepomis humilis</i>	May to July; nest in colonies with the male excavating a small depression in the sand or gravel; male stays with the nest for about 5 days or until the eggs hatch	Usually found in turbid, sluggish waters, with substrates of mud or gravel, and with little to moderate vegetation; mostly in quiet streams, but also vegetated lakes and ponds; most common in the sandy or silty pools of creeks and small rivers; it feeds principally on young crayfish and immature aquatic insects	It does not grow to large sizes; the Topeka shiner is reported to nest over orangespotted sunfish nests	
Green sunfish <i>Lepomis cyanellus</i>	Spring until late summer when water is between 59 and 86 (about 70 optimally) degrees Fahrenheit; male scoops nest out of gravel or sandy silt in closely populated colonies	Highly adaptable, but tends to become most abundant in rocky situations of either lakes or streams; it prefers warm, shallow water and often occurs near vegetation in ponds, lakes and stagnant reaches of streams and rivers; tolerates murky water, low oxygen levels, and silty bottoms; feed on aquatic and terrestrial insects, crayfish, and small fish	Green sunfish are remarkably tolerant of crowding among themselves; under such conditions they often stunt, creating management problems in small lakes; large populations apparently compete with the young of other fishes for food, or prey directly upon them, thus causing negative impacts to game fish; Topeka shiners are known to nest over green sunfish nests	
Pumpkinseed <i>Lepomis gibbosus</i>	May, June and July when temps are between 60 to 68 degrees; males use their mouths to create a small hole as a nest; females are attracted and deposit several hundred eggs; male guards the nest until hatching	Has been stocked in various places in SD, but is uncommon; typically they are found in shallow lakes, sheltered bays or larger lakes, and quiet areas of slow-moving streams; prefers still waters with dense submerged vegetation; young eat zooplankton until large enough to eat adult and larval insects, as well as snails, small mollusks and other small fish	Pumpkinseed hunt for food at the surface as well as off the bottom; following heavy rains they feed on earthworms and insects washed into the water; it is preyed upon by hawks, ducks and raccoons	

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Bluegill <i>Lepomis macrochirus</i>	Begin in spring when water temps range between 62 and 88 degrees Fahrenheit; individual fish may spawn more than once during the year; the male builds a nest preferably on a sand or gravel bottom, often near other bluegill nests, and later guards the nest and fry	Bluegill prefer slow-moving or standing water with aquatic vegetation or flooded timber; diet consists mainly of larval and adult insects, plankton, snails, and algae	It can be found in nearly all ponds, reservoirs, and lakes of the Dakotas and is a popular sport fish; they are prolific spawners and in unmanaged ponds they can quickly overpopulate and become stunted	
Rock bass <i>Ambloplites rupestris</i>	Spring when temps range between high 60's into the 70's; males fan out a nest in coarse sand or gravel and guards the eggs and fry	Clear-water lakes and streams, spending most of their time around rocks and boulders; prefer streams and lakes with clear, well-oxygenated, hard water, and boulder and sand bottoms	Rock bass can camouflage itself by changing color and patterns to match its surroundings; a sedentary and secretive fish spending much of its time passively hiding in the shadows of underwater structures	
Smallmouth bass <i>Micropterus dolomieu</i>	Mid-April to July on rocky lake shoals, river shallows, backwaters or move into creeks or tributaries; nest building and spawning occur when the water temp is 55 to 70 degrees, but most activity occurs at or above 59 degrees	Smallmouth bass prefer clear, clean water and are seldom found in murky water; they live in all types of natural lakes and impoundments, as well as rivers and streams with moderate current; fry feed on microcrustaceans; juvenile eat larger insects, crayfish, and fish; adults primarily feed on fish and crayfish	The smallmouth is probably native to extreme northeastern SD; because of stocking, it is found throughout the state; they exhibit strong, cover-seeking behavior and prefer protection from light in all life stages; deep dark quiet water is used for cover, but bass use all forms of submerged cover, such as boulders, rocks, stumps, root-masses, trees, and crevices, without apparent preference for any one type	
Largemouth bass <i>Micropterus salmoides</i>	Begins in spring when water temps are between 53 and 60 degrees Fahrenheit, but most occurs between 60 and 72 degrees; males sweep out a nest in sand or gravel; gravel is preferred site; after spawning, he guards the eggs and fry;	Largemouth bass are native to eastern SD, but have been stocked throughout the state; they thrive in natural lakes and reservoirs, especially those with an abundance of aquatic vegetation and flooded timber; they do best in waters that are somewhat protected from wind, relatively clear, and have submerged aquatic vegetation; they eat anything available including fish, crayfish, and insects	It inhabits weedy areas in ponds and lakes; their feeding intensity is bimodal, with peaks in the early morning and late evening;	

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SPECIES	SPAWNING	HABITAT	CONCERNS/NOTES	STATUS
White bass <i>Morone chrysops</i>	Make spawning runs in large schools during the spring when water temps reach about 60 degrees Fahrenheit; spawning is usually in rivers, but also on the shoal areas of lakes; females deposit between 250,000 and 1 million heavy, adhesive eggs either near surface or midwater in 6-7 feet	White bass are exclusively freshwater fish that prefer large, clear lakes, but are found in some large streams and rivers; they often travel in large schools as they feed near the surface eating primarily other fish, but have been know to eat aquatic insects, and crustaceans	In SD, they are primarily found in the Missouri River its tributaries, and some eastern lakes, primarily large lakes connected to major river systems and in big rivers with moderate current; they prefer clear water but will tolerate murky conditions	
Brook stickleback <i>Culaea inconstans</i>	In spring when water temps are between 50 and 70 degrees, male builds nest of algae, sticks, other plant matter with his own sticky secretion; he guards nest and young	Brook sticklebacks are found in cold, clear to slightly turbid streams, rivers, lakes and spring-fed ponds; they are mostly carnivorous eating insect larvae, insects, water fleas, worms, snails, and sometimes fish eggs and algae	Despite the sharp spines on their backs, sticklebacks are forage for numerous fish, including brook trout, largemouth and smallmouth bass, northern pike, yellow perch, walleyes, and bowfins; likewise they are eaten by fish eating birds, including herons, kingfishers, mergansers, and terns	
Burbot <i>Lota lota</i>	Winter spawner or in very early spring before the ice melts; usually at night, typically under the cover of ice in shallow sandy bays or gravel shoals	Prefers the deeper, cooler water of lakes and large rivers, normally hiding by day and emerging at night to feed; young burbot feed primarily on insect larvae, and adults subsist on crayfish and fish	Limited to Missouri River drainage in South Dakota Burbot are rather reclusive, they spends most of the day in deeper, cooler water, emerging at night to feed	
Stonecat <i>Noturus flavus</i>	In A.02pril or May eggs are deposited in a compact cluster beneath flat stones, fertilized and are protected by one of the parents	The stonecat inhabits rivers and streams and prefers riffle areas with rocky bottoms, but they can also be found under rocks or weedy shorelines of lakes and ponds; feeds mostly on immature stages of various riffle-dwelling insects, with occasional small fish	Stonecats have been found in the Missouri River in strong current over sand substrate; they are active at night feeding on immature stages of riffle-dwelling insects; they are omnivorous and extremely adaptable in seeking food items in ponds and lakes	

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Flathead catfish <i>Pylodictis olivaris</i>	June and July when water temps reach 72-75 degrees Fahrenheit; male and female pair up and they construct a nest usually a large hole under a bank or log or dig thru silt and mud until they reach gravel; males fan the eggs and protects young until they feed on their own	Limited to large rivers in the southeastern part of South Dakota; Young flatheads often live among rocks in a slight current, while the adults prefer to live in deep pool, backwaters, and other sheltered places in the sluggish parts of rivers; it is a bottom dwelling species; young eat a variety of aquatic insects, crayfish, small fish, and worms; adults are almost entirely piscivorous, eating mostly live fish	Flatheads spend the day in deep water or under cover and move to shallows and riffles to feed at night	
Channel catfish <i>Ictalurus punctatus</i>	When water temps reach about 75 degrees Fahrenheit they spawn in depressions, undercut banks, and submerged logs	They inhabit many types of waters, but if given a choice will most likely be associated with flowing waters; adults often concentrate in larger deep pools in rivers around submerged logs; they are omnivorous and eat a variety of plant and animal species that include insects, aquatic worms, freshwater clams, fish and algae	Channel cats are native to the Missouri River drainage in South Dakota; they can live more than 10 years and can exceed 30 pounds	
Yellow bullhead <i>Ameiurus natalis</i>	May or June when water temps are near 70 degrees Fahrenheit in 1½ to 4' deep water; nests are constructed by male, fry are guarded by parent fish until late July or August	Common in pools, backwaters, and sluggish current over soft substrate in creeks and small to large rivers; oxbows, ponds, and impoundments, especially waters with heavy vegetation; it is a nocturnal scavenger and predator, feeding on insect larvae on or in the bottom, as well as on crustaceans, small mollusks, crayfish, and small fishes	The yellow bullhead is less common than the black bullhead and is more or less confined to the eastern one-half of South Dakota	

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Black bullhead <i>Ameiurus melas</i>	May or June when water temps are around 70 degrees Fahrenheit; they are nest builders excavating nests in mud bottoms usually under matted vegetation, pieces of wood, or banks	Black bullhead are abundant in most natural lakes and in some man-made lakes and ponds, as well as in backwaters and sloughs of rivers, and rare in flowing water; they feed primarily on insects and fish (live or dead), but also graze on plant material	Black bullheads are the most common bullhead species, in SD, and are found throughout the state; they are a popular game fish and can often reach two pounds or more, but they overpopulate and stunt in certain waters; they are able to tolerate more turbid water than brown or yellow bullheads; they tolerate water with only small amounts of dissolved oxygen	
Mountain sucker <i>Catostomus platyrhynchus</i>	Late spring to early summer over gravel riffles in streams	Small streams with aquatic vegetation and undercut banks; primary food is algae that it scrapes from rocks, higher plants, and occasionally invertebrates	In SD, this benthic (bottom dwelling) fish is found in the clear, cold streams and a few lakes of the Black Hills	
White sucker <i>Catostomus commersoni</i>	Migratory spawning runs commence in early spring that may be initiated by runoff from early snow melt; actual spawning occurs in late spring when water temps are between 57 and 68 degrees Fahrenheit	White suckers are benthic (bottom dwellers) species that live in all kinds of lakes and streams from clean, stream-fed brooks to slow-moving, turbid (cloudy) rivers; typical food includes a variety of aquatic insect larvae, waterfleas, sideswimmers, snails, clams, algae, other plant matter, detritus (decaying matter), and fish eggs	They are relatively long-lived, with life spans of 15 years or more; although they can reach about 5 lbs., they are more well-known as the common "chub minnow," it is an important forage fish eaten by walleye, trout, muskellunge, northern pike, largemouth and smallmouth bass; it is also eaten by fish-eating birds such as herons, loons, bald eagles, and osprey	
Shorthead redbhorse <i>Moxostoma macrolepidotum</i>	In late April to early June (water temps are usually between 47-61 degrees Fahrenheit) they migrate upstream and congregate on clean, shallow, gravel riffles where eggs are fertilized and abandoned to hatch in 7 to 10 days	These fish are usually found in rivers, but also occurs in lakes and streams, throughout the state; they prefer water ranging from clear to moderately turbid (cloudy) with bottoms of sand, gravel, and rock; as a bottom feeder it eats insect larvae, waterfleas, copepods, sideswimmers, worms, and other small invertebrates	Native to and inhabits a variety of stream types, in SD; it is most abundant in moderately large rivers having a preponderance of gravelly or rocky bottoms; it is a common item eaten by fish like northern pike, walleyes, and smallmouth bass	

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River carpsucker <i>Carpiodes carpio</i>	Late spring when temps range between 65 and 75 degrees Fahrenheit; large fish congregations in flowing water over gravel and sandy bottoms	Occur in quiet, silty bottomed areas of lakes and reservoirs; when in rivers, they prefer sandy bottomed areas; food includes small aquatic worms, algae, and crustaceans	In South Dakota, river carpsuckers are found throughout the Missouri River drainage, living in large schools	
Smallmouth buffalo <i>Ictiobus bubalus</i>	Spring when water temps reach 60 to 65 degrees Fahrenheit; eggs are broadcast over weeds and mud bottom, hatching one to two weeks	Prefers clearer water than the bigmouth buffalo; it is primarily a bottom feeder, eating invertebrates, algae, detritus, and sand	In South Dakota, it lives in the Missouri, James, and Big Sioux rivers	
Bigmouth buffalo <i>Ictiobus cyprinellus</i>	Spring when water temps reach 60 to 65 degrees Fahrenheit; adults migrate into the shallow bays and inlets of lakes or into sloughs and flooded marshes of large rivers spawning over low, sparse vegetation, rocks, or even mud, but in clear water	Live in lowland lakes, sloughs, and big rivers with slow to still waters and bottoms of mud, silt, sand, and gravel; they are especially abundant in flood plain and oxbow lakes; it eats plankton, copepods, water fleas, bottom plants, aquatic insects, mollusks, small fish, and fish eggs	Largest and most important commercial species among the suckers of the Mississippi River drainage; in South Dakota, bigmouth buffalo are found in the Missouri River complex and its tributaries, as well as in many of the natural lakes in the eastern part of state	
Flathead chub <i>Platygobio gracilis</i>	Mid or late summer, details of spawning habits are not well known	In the Missouri River, it is found in more or less continuously turbid waters where the current is swift and bottom is composed of sand or fine gravel; it can also be found in pools with moderately clear water, little current, and bottoms composed of coarse gravel and bedrock; feeds almost exclusively on terrestrial insects that fall into the water, but will eat other small invertebrates and plant material	The flathead chub is the most common chub in western South Dakota rivers that flow into the Missouri River; the greatest threat to the flathead chub are nonpoint source pollution and mainstem impoundments impacting flow regimes; other threats across its range include dewatering of rivers for irrigation and degradation of riparian areas	

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Creek chub <i>Semotilus atromaculatus</i>	March to May when water temps are between 55 and 65 degrees Fahrenheit; males dig a pit then build a mound just upstream; eggs are deposited in the pit then covered with stones	Prefer small to moderate size streams and rivers; are tolerant of turbid (cloudy) water but favor clear to faintly cloudy waters over hard bottoms (gravel, sand, or rubble) rather than soft (silt and mud); they do especially well behind beaver dams; they are omnivorous eating small copepods and waterfleas as larvae; as they grow they add a greater variety of aquatic insect larvae, terrestrial insects, and eventually small fish	Found statewide in South Dakota inhabiting small prairie creeks and occasionally clear lakes; during dry weather, creek chubs can survive in isolated pools; they are food for many predators including walleyes, trout, northern pike, largemouth and smallmouth bass, loons, kingfishers, and mergansers; are harvested by bait dealers and sold as bait and are sometimes caught by hook and line using live bait or dry flies	
Golden shiner <i>Notemigonus crysoleucas</i>	Extended period of May to July with temps between 70 and 85 degrees Fahrenheit; females deposit eggs over filamentous algae and submerged weed beds; after spawning the eggs are abandoned	They prefer clear, vegetated habitat in wetlands, ponds, lakes, impoundments, and slow-moving streams; they feed on algae and higher plants, as well as insects and snails	Statewide, in SD, where they are common in ponds and lakes growing as large as a foot and serving as food for larger predators; culture of golden shiners is common across the country because they are a popular bait fish and are often stocked in ponds, however not used frequently in SD	
Common shiner <i>Luxilus cornutus</i>	May and June; build nest and spawn in the spring over clean gravel and commonly utilize the nests of other minnows	Common in small to medium-sized streams with clear, cool water with moderate to swift current and gravel to rubble bottom; feed primarily on aquatic and terrestrial insects, small crustaceans, and plant material	In SD, they may occur in warmer, more turbid waters; they are an important forage species and are used as bait by anglers	
Emerald shiner <i>Notropis atherinoides</i>	Late spring or early summer with water temps around 75 degrees Fahrenheit; spawn at night just below the surface in shallow water over sand or firm mud	The emerald shiner is a fish of big waters; it feeds on algae while young and on insects and small crustaceans as an adult	It is common in large streams and Missouri River system reservoirs, in SD, where it serves as an important prey fish; it inhabits the mid-depth to surface waters of the main channel and chutes in large streams where they are often found in large schools	

Table 2. Summary of key information regarding fish species found in South Dakota for locations and timing of stream habitat management and improvement measures.				
SPECIES	SPAWNING	HABITAT	CONCERNS/NOTES	STATUS
Fathead minnow <i>Pimephales promelas</i>	Throughout spring and summer when water reaches 60 degrees Fahrenheit; male selects nest site usually under logs, rock, stick, cans, or whatever usually on substrates of gravel or sand	The most common minnow of the prairie region inhabiting rivers, lakes, and wetlands, preferring warm, shallow water; they are opportunist feeders eating just about anything they come across, such as algae, protozoa, plant matter, insects (adults and larvae), rotifers and copepods	Common shiners are the most important fish used as a baitfish in the Dakotas; during the breeding season, males develop black heads and small bumps (breeding tubercles) across their snouts; in lakes and deeper streams, fatheads are common prey for crappies, rock bass, perch, walleyes, largemouth bass and northern pike; they are also eaten by snapping turtles, herons, kingfishers, and terns	
Common carp <i>Cyprinus carpio</i>	Spring to summer peaking between 60 and 70 degrees; they spawn in shallow, vegetated areas, the eggs hatching in 3 to 10 days depending on water temps	Carp are primarily a warm water species and do very well in warm, muddy, highly productive (eutrophic) waters; fry are planktivorous; adults are primarily benthic, feeding on both plant and animal material	They are abundant in most of the warm water lakes and slow moving streams of SD; native to Asia, they were introduced in this country, in the 1880's, heralded as a new sport and food fish; they are now well established throughout the state	
Muskellunge <i>Esox masquinongy</i>	April to May at water temps from 48 to 60 degrees Fahrenheit in 1 to 10 foot of depth in bays, creeks, shallow weedy areas, and flooded woods; eggs are scattered over dead vegetation	Muskies are solitary and stay close to their home range unless food is in short supply; they lurk near drop-offs from rock or sand bars in the middle of lakes, along weed beds or other vegetation, and in shady waters close to shores that are fringed with overhanging trees; they prefer larger lakes with deep and shallow basins and large beds of aquatic plants	In SD, the fish has been stocked in Lake Amsden in the northeast and in the lower Missouri River; adults prefer mostly perch, with suckers, shad, minnows, carp, ciscos, whitefish, and bullheads thrown in; they also take bugs, frogs, small mammals, birds and ducks	

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Northern Pike <i>Esox lucius</i>	In spring soon after ice melts, when water temps are around 40 degrees Fahrenheit; they spawn over submerged vegetation in shallow water in the bays of large lakes or at the mouth of a tributary or creek	Generally prefer cool water habitats and do best in deeper bodies of water; however they have adapted well to many of the shallower (warmer) prairie lakes; diet consists primarily of fish, but are know to also eat insects and other small invertebrates and sometimes small birds and mammals	In SD, they were native only to the lakes and rivers in the eastern one-fourth of the state; they have since been introduced into most rivers, reservoirs, lakes and ponds throughout the state; northern are often the top predator in a lake; in this way they help balance fish populations by preventing smaller fish species from overpopulating.	
Rainbow smelt <i>Osmerus mordax</i>	Spring, principally during darkness; eggs sink to the bottom and become attached to gravel substrate by a short stalk formed from the outer shell membrane	Smelt are schooling fish inhabiting the cool, medium depth of lakes; they feed on many small invertebrates and some small fish	Were stocked as prey fish in Lake Sacagawea in 1971 and found their way downstream into the cool water of Lake Oahe where they provide a source of prey for large predators such as northern pike, walleye, various trout, and chinook salmon	
Chinook salmon <i>Oncorhynchus tshawytscha</i>	Spawn from late summer to late fall, depending of the run in streams that are larger and deeper than other salmon use	Anadromous, spending one to eight years at sea before returning to natal streams to spawn; freshwater streams and estuaries provide terrestrial and aquatic insects, amphipods, and other crustaceans while young and primarily on other fish when older	In SD, the chinook is landlocked beginning life in a hatchery, having no access to suitable spawning streams and no direct access to an ocean; so eggs are collected each year at Whitlock's Bay Spawning Station near Gettysburg; the eggs are transported to state hatcheries for incubation, hatching in December; the young are raised to four inch fingerlings and then stocked into Lake Oahe at Whitlock bay during May and June	
Lake trout <i>Salvelinus namaycush</i>	Late summer to December spawn in shallow, gravel-bottomed water; no nest, but males clear area of debris; eggs are laid on the gravel and settle among the stones, remaining there until hatching in the early spring	Native to northern North America; the lake trout is actually a char (not a true trout); it inhabits cold waters; they feed on fish, insects, crustaceans, and plankton	Introduced into Lake Oahe along with chinook salmon to create a cold water fishery; there are also lake trout and hybrid splake in Pactola Reservoir in the Black Hills	

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Brook trout <i>Salvelinus fontinalis</i>	Fall spawner	Clear cold streams and lakes; prefer colder water than rainbow or brown trout and maintain their numbers in Black Hills streams by natural reproduction; eat mostly small insects and small invertebrates	Native to eastern U. S. and Canada; have been introduced throughout the western U. S. and are found in most headwater reaches of Black Hills streams	
Rainbow trout <i>Oncorhynchus mykiss</i>	Late March thru early July depending on winter severity and specific location female prepares redd (nest) 4 to 12" deep and 10 to 15 inches in diameter; after fertilization, eggs are covered with gravel	Cold water fish preferring water temps between 55 to 60 degrees Fahrenheit in lakes and streams with high oxygen content; can survive prairie lakes and streams, as long as there is cool, oxygenated water in the depths; young eat crustaceans, plant material, and aquatic insects and their larvae; adults turn more to a diet of fish, salmon carcasses, eggs, and even small mammals	Native to the Pacific slope of North America, but have been widely introduced on every continent, except Antarctica; they have been stocked in the Black Hills streams, Missouri River system, and many impoundments west of the Missouri River; limited natural reproduction occurs in Black Hills streams; most populations in the state are maintained by stocking	
Brown trout <i>Salmo trutta</i>	Fall spawner building nests (redds) on gravelly stream bottoms; the young hatch the following spring	More fish-eating than rainbow or brook trout, but feed extensively on insects as well; they tolerate somewhat warmer water than brook or rainbow trout and can live in waters that occasionally exceed 70 degrees Fahrenheit for short periods of time	Native to Europe; have been extensively introduced in U. S.; wild populations are more easily maintained by natural reproduction in many Black Hills streams and Gary Creek in eastern SD; they are also found in the tail waters of the Missouri River dams	
Goldeye <i>Hiodon alosoides</i>	Early spring spawner beginning when water temps reach 50 degrees Fahrenheit; in larger rivers, the spawning areas are located in shallow, turbid (cloudy) pools and backwaters	Favor the more quiet areas of turbid (cloudy) rivers and their connected lakes and marshy backwaters or the shallow, muddy areas of larger lakes; they are opportunistic carnivores (it eats whatever animals it can find); its most frequent menu items include aquatic insect larvae and fish of every species small enough to swallow	In SD, the goldeye is most commonly found in the Missouri River and its impoundments; small goldeyes serve as prey fish for predators such as walleye and northern pike.	

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Gizzard shad <i>Dorosoma cepedianum</i>	Late April to early May usually over flooded terrestrial vegetation in shallow water	Most common in deep, open water of medium to large rivers, lakes and impoundments; often ascends creeks and small rivers with well-developed pools; commonly enter brackish water; prefer low gradient waters with an abundance of phytoplankton	South Dakota is close to the northern limit of distribution for this species, which is found only in the Missouri River system up to Lake Oahe and in a few other rivers and lakes in the state; they form large schools are heavily preyed upon by fishes such as crappies, walleyes, and northern pike.	
American eel <i>Anguilla rostrata</i>	Between January and March in the Sargasso Sea area of the Atlantic Ocean, northeast of Cuba	It probably has the broadest variety and diversity of habitats of any fish species in the world occurring in North American freshwater rivers and lakes, estuaries, coastal areas and open ocean; eels are voracious carnivores primarily seeking living prey as well as feeding on carrion	They are seldom collected, in SD, and their movement up and down the Missouri River was stopped by the construction of Gavins Point Dam	
Shortnose gar <i>Lepisosteus platostomus</i>	Spawn in shallow water over vegetation in May or June when water temp is around 70 degrees Fahrenheit	Common in the Mississippi River and rare in the lower reaches of the larger tributaries to this river, occasional in oxbows and tributaries of Missouri River and natural lakes; young feed on micro-invertebrates and mosquito larvae; adults feed on fish primarily and some insect larvae and crayfish	Shortnose gar occur in the Missouri River and its tributaries in eastern SD most often in quiet pools and backwaters and are the most common gar in the state.	
Shovelnose sturgeon <i>Scaphirhynchus platyrhynchus</i>	Early May and June, with the spawning run being greatest during years of low flow, over sand and gravel in large channels with fast current	It prefers the fast currents of large rivers with sand or gravel bottoms, but can live in muddy rivers; rather widely distributed in the Mississippi and Missouri Rivers and is occasionally collected in the larger tributaries of these rivers; nowhere is it abundant, but it is considered common in many navigation pools of the Mississippi; it is mostly a bottom feeder feeding primarily upon insect larvae, small mollusks and other bottom organisms	Shovelnose sturgeon are the most abundant sturgeon in the Mississippi and Missouri rivers and larger tributaries; smaller than pallid sturgeon, the average size being about 1 to 2 lbs. and a large specimen would be 5 lbs.	