

County	Park	Upstream River Mile	560.2
Classification	CM: Confined meandering	Downstream River Mile	557.2
General Location	Devil's Slide area	Length	3.00 mi (4.83 km)

Narrative Summary

Reach PC2 is located north of Gardiner near Devil's Slide. The reach is three miles long, and is confined by glacial terraces that taper in the northward direction as the river approaches Yankee Jim Canyon. This reach contains over 3,000 feet of rock riprap, all of which is against the toe of the terrace where the river flows adjacent to Highway 89 on the east side of the river. About one third or 1,200 feet of that riprap was built since 2001, where older riprap was extended against the highway. The riprap covers 9.3 percent of the total bankline. Migration rates are very low, and the total CMZ acreage is 111 acres. Land use is dominated by non-irrigated agriculture, and irrigated agriculture has seen some conversion from flood to sprinkler and pivot. In 1950, there were 152 acres of land in PC2 under flood irrigation, and in 2011 there were none. Whereas there was no sprinkler or pivot irrigation in 1950, now there are 133 acres of sprinkler and 62 acres under flood irrigation. The Brogans Landing Fishing Access Site is located in the lower end of the reach.

This area of the upper Yellowstone River basin experienced three severe floods in the last 20 years. The largest floods were in 1996 and 1997, when the 32,200 cfs peak flow measured at the Corwin Springs gage exceeded a 100-year flood for those two years in a row. The 1974 and 2011 floods were major as well, with both events exceeding 30,000 cfs. The Corwin Springs gage is located downstream of Reach PC2 at the Corwin Springs Bridge.

CEA-Related observations in Reach PC2 include:

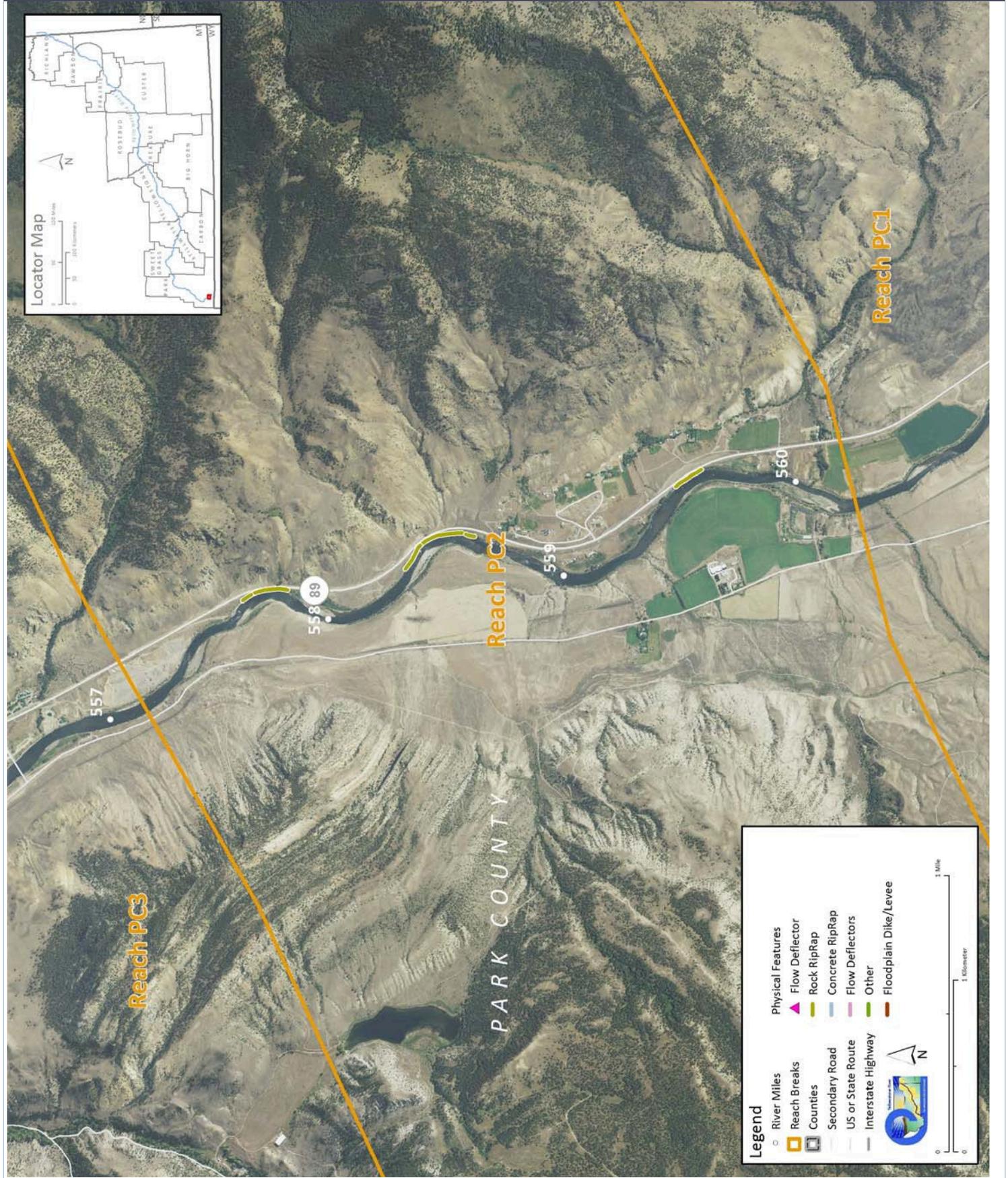
- Urban/Exurban development at Gardiner

No reach-specific Practices have been identified for this reach.

The following table summarizes some key CEA results that have been used to describe overall condition and types of human influences affecting the river. The values are specific to this single reach. Blanks indicate that a particular value was not available for this area. This information is consolidated from a large dataset that is presented in more detail in the full reach narrative report.

Discharge	Undev.	Developed	% Change	"Undeveloped" flows represent conditions prior to significant human development, whereas "developed" flows reflect the current condition of both consumptive and non-consumptive water use.		
2 Year (cfs)	17,600	17,600	0.0%			
100 Year (cfs)	33,500	33,500	0.0%			
Bankfull Channel Area (Ac)	1950	1976	1995	2001	1950-2001	Bankful channel area is the total footprint of the river inundated at approx. the 2-year flood.
	107.2			98.5	-8.8	
Physical Features	2011 Length (ft)	% of Bankline	2001-2011 Change	There are additional types of bank armor such as car bodies and steel retaining walls, but they are relatively minor.		
Rock RipRap	3,043	9.3%	1,255			
Concrete Riprap	0	0.0%	0			
Flow Deflectors	0	0.0%	0			
Total	3,043	9.3%	1,255			
Length of Side Channels Blocked (ft)	Pre-1950s	Post-1950s	Numerous side channels have been blocked by small dikes.			
	0	0				
Floodplain Turnover	1950 - 1976	1976 - 2001	1950-2001 In-channel riparian encroachment (negative number indicates retreat)	The rate of floodplain turnover reflects how many acres of land are eroded by the river. Turnover is associated with the creation of riparian habitat.		
Total Acres Acres/Year Acres/Year/Valley Mile			acres			
Open Bar Area	Point Bars	Bank Attached	Mid-Channel	Total	The type and extent of open sand and gravel bars reflect in-stream habitat conditions that can be important to fish, amphibians, and ground-nesting birds such as least terns.	
Change in Area '50 - '01 (Ac)						
Floodplain Isolation	Acres	% of FP	Floodplain isolation refers to area that historically was flooded, but has become isolated do to flow alterations or physical features such as levees.			
5 Year 100 Year						
Restricted Migration Area	Acres	% of CMZ	Channel Migration Zone restrictions refer to the area and percent of the CMZ that has been isolated by features such as bank armor, dikes, levees, and transportation embankments.			
Land Use	1950	2011	1950	2011	Changes in land use reflect the development of the river corridor through time. The irrigated agricultural are is a sub-set of the mapped agricultural land.	
Agricultural Land (Ac)	1,158.9	1,026.8	Flood (Ac)	250.9	0.0	
Ag. Infrastructure (Ac)	20.8	24.1	Sprinkler (Ac)	0.0	132.7	
Exurban (Ac)	9.2	145.5	Pivot (Ac)	0.0	61.6	
Urban (Ac)	0.0	0.0				
Transportation (Ac)	35.8	35.8				
1950s Riparian Vegetation Converted to a Developed Land Use (ac)	To Irrigated	To Other Use	Total Rip. Converted	% of 1950s Rip.	Changes in the extents of riparian vegetation are influenced by land use changes within the corridor.	
National Wetlands Inventory	Acres	Acres per Valley Mi	Total Wetland Acres	Wetlands units summarized from National Wetlands Inventory Mapping include Riverine (typically open water sloughs), Emergent (marshes and wet meadows) and Shrub-Scrub (open bar areas with colonizing woody vegetation).		
Riverine	0.0	0.0	4.9			
Emergent	2.5	0.9				
Scrub/Shrub	2.4	0.9				
Russian Olive (2001) (Appx. 100-yr Floodplain)	Acres	%	Russian olive is considered an invasive species and its presence in the corridor is fairly recent. Its spread can be used as a general indicator of invasive plants within the corridor.			
	0.0	0.2%				
Riparian Forest at low risk of Cowbird Parasitism (Ac/Valley Mile)	1950	1976	2001	Change 1950-2011	Cowbirds are associated with agricultural and residential development, displacing native bird species by parasitizing their nests.	

PHYSICAL FEATURES MAP (2011)



CHANNEL MIGRATION ZONE MAP

