



Yoho
National Park

Parc national
Yoho



Kicking Horse River

**Canadian Heritage Rivers System
10-Year Monitoring Report
2011-2020**



Canadian
Heritage Rivers
System

Réseau des
rivières du patrimoine
canadien



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Introduction

The Canadian Heritage Rivers System (CHRS) is a national program that recognizes and promotes the conservation of rivers of outstanding national value. The program was established in 1984 as a cooperative effort of the federal, provincial and territorial governments. The CHRS currently includes 41 designated rivers across Canada representing a diversity of river environments.

The Kicking Horse River in Yoho National Park was designated a Canadian Heritage River in 1989 in recognition of its important natural, cultural and recreational values. The designated section includes the 49 km headwater segment of the Kicking Horse River within the park, along with its main tributary in the upper watershed, the 18.5 km Yoho River (Figure 1).

The Parks Canada Agency reports to the Canadian Heritage Rivers Board every ten years on the condition of the river and the values for which it was designated. The previous report covered the period 1999-2010 (Parks Canada 2011). This report describes factors affecting the designated portion of the Kicking Horse River between 2011 and 2020 following the 10-year reporting format presented in the *Canadian Heritage Rivers Principles, Procedures and Operational Guidelines 2023*.

The objectives of this report are to:

- provide a summary of the designated river and its values;
- provide a brief summary of significant events, actions and research that occurred during this time period relevant to the designated section of river;
- outline any changes or threats to the natural, cultural and recreational values for which the river was designated;
- report any changes to the CHRS integrity values relative to the designation;
- report the status of the CHRS plaque; and,
- provide recommendations for the continued recognition of the Canadian Heritage River.

Background

The Kicking Horse Canadian Heritage River is entirely within the boundaries of Yoho National Park and is managed in accordance with the *Canada National Parks Act* and the Yoho National Park Management Plan (2010). The river was nominated for its outstanding representation of the following natural, cultural and recreational values and themes.

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Natural Values

Representation of Earth's History

The Kicking Horse River watershed contains significant geological features representing over 600 million years of earth's history. Key elements include dramatic evidence of tectonic processes, the world-renowned Burgess Shale that provides key evidence of the evolution of early complex life forms, classic examples of the Main Ranges of the Rocky Mountains and westslope of the Continental Divide, evidence of significant glacial erosion and deposition, and significant examples of fluvial erosion and deposition.

Representation of Ongoing Processes

Many of the processes that created the current landscape continue to actively shape the land. These include glaciers and icefields, and on-going fluvial processes that continue to carve gorges and create dynamic stream channels, outwash plains, rapids and waterfalls. The river's position on the westslope of the Rocky Mountains means it is subject to local climate effects resulting in a moister environment than the eastern side of the Continental Divide. This results in unique vegetation assemblages and a more active avalanche regime. Finally, the protection afforded by Yoho National Park means the watershed contains a large, intact ecosystem that is predominantly self-regulated.

Physiographic and Landscape Uniqueness

The Kicking Horse River watershed contains several outstanding examples of cordilleran landscape features. These include classic sedimentary mountains of the Main Ranges of the Canadian Rockies, the Wapta and Waputik Icefields on the Continental Divide, spectacular waterfalls including Takakkaw Falls, Twin Falls, Laughing Falls, and Wapta Falls, the Field Flats and the Ottertail Flats braided outwash plains, montane wetlands including Leancoil Marsh, and the Kicking Horse River's natural bridge and upper gorge.

Cultural Values

Canadian Development

Kicking Horse Pass and the Kicking Horse River valley was chosen as the route for Canada's first transcontinental railway through the Rocky Mountains. The corridor was also chosen as the route for the Trans-Canada Highway. Kicking Horse Pass National Historic Site was designated to commemorate this important development in Canadian history.

Cultural Association

Archaeological evidence indicates that the Kicking Horse River valley and adjacent areas were used for travel, hunting and gathering by Indigenous peoples for thousands of years. The Kicking Horse River watershed is intimately associated with the creation of Yoho National Park in 1886, and hence has relevance for the history of nature conservation and wilderness recreation in Canada. It also has cultural associations with the Palliser Expedition of 1857, and with Edouard Gaston Deville, Surveyor General of Canada from 1885 to 1924 and a Person of National Historic Significance.

Historical Themes and Unique Resources

The Kicking Horse River valley provides important representation of the historical theme of transportation. The river corridor was chosen as the route for the first transcontinental railway in Canada, and later as the route for the Trans-Canada Highway. The fact that these two national transportation corridors still occupy the same route increases this historical relevance. There are also several unique cultural resources associated with these historical events, including the development of the Spiral Tunnels, the original stone and iron railway bridge on the Field Hill, mine portals above the river in Mount Field and Mount Stephen, and the creation of the village of Field on the banks of the Kicking Horse River.



Recreational Values

Recreational Experience

The designated area along the Kicking Horse River provides a range of outstanding recreational opportunities. These include scenic paddling routes on the Kicking Horse River with Class II and III whitewater, and challenging routes on the Yoho River with Class IV and V whitewater. Nearby hiking trails, day use areas and scenic viewpoints provide abundant opportunities for visitors to enjoy the beauty of the river valley and surrounding landscape. Park campgrounds at Takakkaw Falls and along the Kicking Horse River in proximity to the Trans-Canada Highway provide unique opportunities for visitors to experience this river environment. The information and interpretive programs in Yoho National Park help visitors to learn about and understand the important natural and cultural features and recreational opportunities available in the Kicking Horse River corridor.

Chronology of Significant Events, Actions and Research, 2011-2020

Year	Event, Action, Research
2011	A large avalanche on Mt. Field crossed the Kicking Horse River and destroyed a portion of the Kicking Horse Campground, resulting in the temporary closure of the facility. Parks Canada initiated a prescribed fire in the Ottetail drainage and a smaller fire on Mt. King above the Kicking Horse River. Fire restoration is intended to improve the health of forest ecosystems and reduce the likelihood of large catastrophic wildfires in the Kicking Horse valley. Canadian Pacific Railway completed a new bridge over the Kicking Horse River in the Ottetail wetlands. The previous bridge was damaged by flooding, and the new bridge doubled the span to accommodate larger peak flow events.
2012	A major rainfall event during the spring freshet caused the Kicking Horse River to overflow its banks and flood the Chancellor Peak Campground situated within the river floodplain, resulting in the permanent closure of the campground. Parks Canada and Canadian Pacific embarked on a 5-year research project to investigate the root causes of grizzly bear (<i>Ursus arctos</i>) mortality along the Canadian Pacific Railway in Yoho and Banff national parks. Parks Canada and Mountain Equipment Co-Op hosted a “Learn to Camp” event at Kicking Horse Campground to introduce new campers to the basic skills of camping.
2013	Remaining infrastructure in the Chancellor Peak Campground was removed. A scale model of the Canadian Pacific Railway section through Kicking Horse Pass and the Spiral Tunnels was installed at the Field Visitor Centre to help visitors appreciate the scope of this historic site. The first wildlife underpass on the Trans-Canada Highway in Yoho was constructed near Wapta Lake, the source of the Kicking Horse River.
2014	Aquatic connectivity was restored on Monarch Creek upstream of Kicking Horse Campground with the installation of three new arch culverts that allow fish passage under the Yoho Valley Road and campground roads. Renovation and upgrade of washroom buildings at Kicking Horse Campground was completed. Learn to Camp program offered again at Kicking Horse Campground
2015	Federal Infrastructure Investment of \$62.8 million to address deferred maintenance of assets was announced for Yoho National Park. Most of this funding was allocated for paving and rock slope stabilization on the Trans-Canada Highway, Yoho Valley Road and Emerald Lake Road. Slimy sculpin (<i>Cottus cognatus</i>) samples were collected from the Kicking Horse River to support a molecular taxonomic study of this group of fishes in western North America (Young et al. 2022). The Alpine Club of Canada constructed the Richard and Louise Guy hut near the Des Poilus Glacier. This hut supports winter and spring ski touring in the headwaters of the Yoho River.
2016	A fish sampling program was conducted in the Kicking Horse River after whirling disease, an infectious fish pathogen, was confirmed in Banff. Results were negative. Additional biological water quality monitoring using the Canadian Aquatic Biomonitoring Network (CABIN) protocol was conducted in the Kicking Horse River watershed. Federal funding of \$85.9 million was provided to twin (4-lane) a 6-kilometre stretch of the Trans-Canada Highway (TCH) in Kicking Horse Pass, as well as public consultation, environmental assessment and preliminary engineering design for twinning the remaining 40 km of TCH through the Kicking Horse River valley in the park.

Year	Event, Action, Research
2017	Additional fish sampling to test for whirling disease was conducted in the upper Kicking Horse River. Results were negative. CABIN monitoring using benthic macroinvertebrates was completed. Results indicate good aquatic ecosystem health. A bronze plaque commemorating Elizabeth Parker as a National Historic Person was created as part of Canada 150 celebrations. Elizabeth Parker was a co-founder of the Alpine Club of Canada and her writing encouraged others to explore the Canadian Rockies. The plaque will be located at the top of the access road near Lake O'Hara. Restoration of the historic Takakkaw Falls Patrol Cabin on the Yoho River was initiated to address deterioration that threatened the structural integrity and heritage character of the structure. A single-arch wildlife overpass was constructed as part of the TCH twinning project initiated in 2016. The overpass is located near Wapta Lake, the headwaters of the Kicking Horse River. A mountain goat (<i>Oreamnos americanus</i>) monitoring program was initiated around the upper Kicking Horse River to help understand distribution, habitat use and movement patterns. Data will be used to assist in planning and mitigation for future highway twinning, especially related to wildlife crossing structures. A remote avalanche control system was installed on Mount Bosworth to manage avalanche hazard and protect the Trans-Canada Highway and visitor infrastructure in Kicking Horse Pass.
2018	Parks Canada completed a State of the Park Assessment (SOPA) for Yoho National Park in preparation for a review of the Park Management Plan. The SOPA evaluated indicators related to ecological integrity and visitor experience that are relevant to many of the key values for which the river was designated. A bat inventory was conducted in the Kicking Horse River area that confirmed the presence of six bat species, including the endangered little brown myotis (<i>Myotis lucifugus</i>).
2019	A major train derailment occurred at a bridge over the Kicking Horse River on the Field Hill, resulting in the deaths of three Canadian Pacific Railway employees. The locomotives and 99 grain cars derailed, with several cars falling into the river. The clean up took several months. The Ktunaxa Nation held a cultural camp at the confluence of the Amiskwi and Kicking Horse rivers to help reconnect Ktunaxa people to this part of their traditionally used territory. New washroom and shower buildings were constructed at Kicking Horse Campground along the river. Monitoring was initiated at six sites in the Kicking Horse River area to assess habitat suitability for the endangered black swift (<i>Cypseloides niger</i>). A remote avalanche control system was installed on Mount Stephen to manage avalanche hazard and protect the Trans-Canada Highway and Canadian Pacific Railway along the Kicking Horse River.
2020	Most of the visitor facilities in Yoho National Park were temporarily closed for most of the year due to public health measures related to the COVID-19 pandemic. Park trails and waterways remained available for recreational purposes. Aerial mountain goat surveys were flown in Yoho National Park, including the headwater area of the Kicking Horse River. Data collection was completed for a multi-year research project on wolverine (<i>Gulo gulo</i>), a species of special concern, within the Kicking Horse River valley. Data will help inform planning and mitigation for future proposed twinning of the Trans-Canada Highway. The Kicking Horse CHRS plaque was refurbished by the Parks Heritage Conservation Society.

Changes and Threats to Natural, Cultural and Recreational Values

This section outlines the positive or negative changes to the heritage values of the river that were identified during the 10-year reporting period. It also describes actions taken to address any factors that affect the values for which the river was designated.

Natural, Cultural or Recreational Value	Description of Change or Threat	Reason for Change	Actions Taken in Response	Change/ Threat Still Present?
Aquatic ecosystems	Potential introduction of aquatic invasive species (AIS).	Whirling disease was confirmed in Johnson Lake within Banff National Park in 2016. Whirling disease is an infectious disease of freshwater fish that is spread by a protozoan. The Johnson Lake occurrence was the first confirmed incidence of this disease in Canada. The introduction of zebra mussels and quagga mussels is also a potential threat.	Parks Canada implemented a widespread fish sampling program to test for the potential presence of the disease in other fish populations in the mountain parks. All results from the Kicking Horse River and Yoho National Park were negative. In 2018 Parks Canada implemented an AIS prevention program through a voluntary self-certification process for recreational users who must confirm that all gear has been cleaned, drained and dried before entering park waters. This program became mandatory in 2019.	Yes. The threat persists, especially with increasing recreational use of the river. Potentially negative.
Glacier headwaters	Glacial recession may lead to a reduction in the amount of ice and snow cover available for input to water flows within the upper Kicking Horse basin. The Yoho River derives a significant portion of its flow from the Wapta and Waputik Icefields. Smaller glaciers feed the headwaters of the Kicking Horse River above the confluence with the Yoho River.	Climate change is accelerating the loss of glacial ice in western North America and may lead to reduced seasonal snow cover. The glaciers along the Continental Divide that feed the upper watershed of the designated river are in a state of strong negative mass balance (Parks Canada 2019). Scientific modelling suggests that by 2100 the glaciers in the Canadian Rocky Mountains will lose up to 90% of their volume relative to 2005 (Clarke et al. 2015).	Glacier monitoring is being conducted by the Geological Survey of Canada with support from Parks Canada.	Yes. Negative.
Cultural Heritage	Re-connection of Indigenous people to traditionally used lands and waters.	Indigenous use of traditional gathering place at the confluence of the Kicking Horse and Amiskwi rivers has occurred.	Parks Canada is working with the Secwépemc and Ktunaxa to continue to re-connect them to their traditionally used lands and waters in the park, including the Kicking Horse River.	Yes. Positive.

Natural, Cultural or Recreational Value	Description of Change or Threat	Reason for Change	Actions Taken in Response	Change/ Threat Still Present?
Natural – Fluvial landforms and channel types	Restoration of natural variation in channel morphology in the Chancellor reach.	Flooding of Chancellor Peak Campground occurred due to high stream flows caused by an extreme weather event in 2012.	Permanent closure and removal of campground infrastructure improved the ecological integrity of the river floodplain by allowing fluvial erosion and deposition to occur, thus restoring natural dynamic channel morphology.	Yes. Positive.
Recreational values	Loss of camping opportunities at Chancellor Peak Campground.	Flooding of Chancellor Peak Campground occurred due to high stream flows caused by an extreme weather event in 2012.	Permanent closure and removal of campground infrastructure resulted in a loss of some recreational opportunities on this portion of the river. Future additions to camping opportunities in this area of the park are being considered.	Yes. Negative.
Visitation	Increasing visitation pressures are being felt at popular areas.	Between 2011 and 2019 ¹ visitation to Yoho National Park increased by 28%. Associated impacts include increased litter, creation of unofficial trails, visitor congestion, deterioration of visitor infrastructure, and potential wildlife disturbance.	Parks Canada is increasing messaging related to environmental stewardship. Visitor use management planning will be used to address visitation pressures at key nodes such as Takakkaw Falls.	Yes. Visitation numbers are returning to pre-pandemic levels. Potential negative ecological impacts, but positive impacts related to visitor connection to the park and river system.

¹ In 2020 visitation dropped due to closures related to the COVID-19 pandemic.



Integrity Guidelines

The integrity values assessed during the process to designate the Kicking Horse Canadian Heritage River included the following:

Size

The designated area is of sufficient size to represent key elements of the river environment, its natural, cultural and recreational values.

Viability

Almost the entire watershed of the designated river segment is contained within Yoho National Park (with the small remainder being in Kootenay National Park) and thus is protected as a self-regulating natural unit.

Water Quality

The water in the Kicking Horse River is naturally turbid (during warm season) due to the presence of glacially-eroded rock flour. Impacts of pollution from transportation corridors are considered to be minor and localized.

The Kicking Horse River and its adjacent environment continues to meet all of the integrity guidelines for which it was designated. There have been no significant changes to the integrity values since the last report in 2010.

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Management Recommendations and Current Status

The portion of the Kicking Horse River watershed designated under the Canadian Heritage Rivers System is entirely within Yoho National Park. Management direction for the river for this reporting period is contained within the *Yoho National Park Management Plan* (2010). Achievement of management objectives was evaluated in the *Yoho National Park of Canada State of the Park Assessment* (2018). Key attributes related to the heritage river are described below, with updates to 2020 where available.

Recommendation or Key Action	Status	Comments
Maintain Water Quality	Achieved	Water quality in the Kicking Horse River is measured through a monitoring station located near Field, B.C. This station is operated by Environment Canada in partnership with Parks Canada and evaluates water quality using the Canadian Council of Ministers of Environment (CCME) water quality index. This index assesses water quality relative to the Canadian Environmental Quality Guidelines and provides an estimate of the degree to which water quality may be affected by human activities. Annual results are obtained and reported using a three-year rolling average to dampen any effects related to annual variations in weather and hydrology. Results reported in the SOPA for the period 2009-2016 range from marginal to good. The marginal conditions were attributed to anomalous heavy metal values (Cu, Cd, Cr, Pb, Zn) recorded during an extreme flood event in 2012. The SOPA attributes these anomalies to natural hydrologic processes, although it is possible that the metals were mobilized from historic mining operations in the upper Kicking Horse valley, or from natural bedrock or soil anomalies. The results for the most recent time period analysed (2014-2016) indicate water quality is overall in good condition.
Maintain Healthy Aquatic Ecosystems	Achieved	Parks Canada also monitors aquatic ecosystem health using benthic macroinvertebrate communities as part of the Canadian Aquatic Biomonitoring Network (CABIN). The CABIN protocols compare the biological communities at sample sites to reference sites to assess potential effects of various stressors. The mountain national parks developed a predictive reference condition model in 2011. Random sampling was conducted at 16 sites throughout Yoho National Park, within the Kicking Horse River watershed and compared to the reference model. For the period 2014 to 2016, 15 of the 16 sites were within the reference condition, indicating an overall good rating for this indicator (Parks Canada 2019). One site on the Yoho River was divergent, with a lower number of species than expected. This may have been due to abnormally high glacial runoff and turbidity caused by unusually high temperatures on the sampling day.
Restore native fish species and reduce non-native fish species	Not yet initiated	Native fish species within the upper Kicking Horse River watershed include bull trout, westslope cutthroat trout, slimy sculpin, and pygmy whitefish. These native species are threatened by non-native fish that were stocked historically, including eastern brook trout and rainbow trout. In order to monitor this threat, a stream fish occupancy indicator has been developed for the park. The most recent monitoring results indicate that the upper, middle and lower Kicking Horse River sections, and the Yoho River are all considered to be in poor condition, meaning that non-native fish outnumber native fish species (Parks Canada 2019). Parks Canada staff have collected DNA from bull trout within the Kicking Horse River area. These data will help conserve and restore diminished and segmented populations by identifying genetically pure donor populations. Parks Canada also completed a westslope cutthroat trout pilot reintroduction project to determine the feasibility of using remote site incubation to hatch wild-spawned westslope cutthroat trout eggs. Parks Canada staff have since used these techniques to reintroduce westslope cutthroat trout to areas where they were extirpated from Banff National Park. These techniques can be applied to restore native fish populations in the Kicking Horse River watershed in the future.

Recommendation or Key Action	Status	Comments
Prevent introduction of new non-native species	Ongoing	In 2016, whirling disease was confirmed in Johnson Lake within Banff National Park. Whirling disease is an infectious disease of freshwater fish that is spread by a protozoan. The Johnson Lake occurrence was the first confirmed incidence in Canada. Due to its potential to spread throughout the mountain park watersheds, a comprehensive sampling program was launched to determine if there were more occurrences of the disease. Results for the Kicking Horse River watershed were negative. Additional whirling disease sampling was conducted in 2020 after reports were received of brook trout with spinal deformities in the Field Pond and Ross Lake. Samples tested negative for whirling disease and several other pathogens. The cause of the spinal deformity is currently unknown, however it is suspected to be an over winter deformity.
Restore fire as an ecosystem driver to the landscape of the park.	Ongoing	In 2011 Parks Canada initiated a prescribed fire in the Ottertail drainage and a smaller fire on Mount King above the Kicking Horse River, burning a total of 562 hectares (Figure 2). Fire restoration is intended to improve the health of forest ecosystems and reduce the likelihood of large catastrophic wildfires in the Kicking Horse valley. Additional prescribed fires are planned for the future. A new Fire Management Plan (FMP) for Banff, Yoho and Kootenay national parks was completed in 2020. The FMP is a 10-year plan spanning 2020 to 2030 and outlines prescribed fires and wildfire risk reduction projects.
Maintain viable populations of native species – species at risk.	Ongoing	Whitebark pine was listed as endangered under the Species at Risk Act in 2012, and in 2014 limber pine was assessed as endangered by COSEWIC². Both species are threatened by white pine blister rust, an introduced fungal disease. Management efforts are focussed on identifying and propagating individuals that are naturally resistant to the disease. From 2012-2020, within the Kicking Horse River area, Parks Canada staff identified and collected seeds from 44 whitebark pine and 10 limber pine trees that appear to be rust-resistant. By 2020, 243 limber pine seedlings cultivated from these seeds were planted in the area. These efforts will help to develop naturally resistant populations of limber pine and whitebark pine in the Kicking Horse River area. Grizzly bears were listed as a Special Concern species in 2018. One of the significant threats to grizzly bears is mortality from collisions with trains. From 2012 to 2017, Parks Canada researchers partnered with CP Rail and researchers at the University of Alberta to examine causes of rail mortality for grizzly bears and to identify potential mitigations that could reduce mortality within the Bow Valley in Banff and the rail corridor along the Kicking Horse River in Yoho. This research found that bears travel along railways to scavenge spilled grain and train-killed ungulates. They may also be attracted to the railway because of vegetation along the tracks, and because of the linear nature of the corridor. This research identified potential mitigation measures that could be applied to discourage bears from using high-mortality risk zones. Parks Canada has implemented a number of these actions, including creating alternate travel routes for wildlife near portions of railway and using prescribed fire and forest thinning to improve bear habitat.

² Committee on the Status of Endangered Wildlife in Canada.



The Kicking Horse Canadian Heritage River Plaque, March 30, 2023

Condition of Plaque

The plaque commemorating the Kicking Horse Canadian Heritage River is located adjacent to the river near the Yoho National Park Visitor Reception Centre in Field. The plaque is in good condition. The plaque is mounted on a boulder and is low to the ground. Consequently, it becomes obscured by snow during the winter. Consideration should be given to elevating the plaque to improve its visibility during all seasons.



Summary of Benefits Since Last Report

The location of the designated section of the Kicking Horse River in Yoho National Park ensures a high level of protection for its natural, cultural and recreational values. Potential benefits of the CHRS designation such as improved water quality, research and protection of cultural heritage, development of recreational opportunities, and conservation of biodiversity are achieved as a result of the river being within the national park. The designation as a Canadian Heritage River adds another layer of recognition to the importance of this natural landscape and helps to increase awareness of its value among park visitors. In particular, the CHRS website highlights the Kicking Horse River and increases awareness of its natural, cultural and recreational values.

Access to additional funding for research and promotion of the river is another important benefit of participation in the CHRS. Parks Canada has received funding from the CHRS to conduct aerial drone surveys of the Kicking Horse River. High resolution drone imagery acquired through this work will assist in mapping natural and cultural resources and will be used to assess change over time along the river corridor.

Overall Assessment

The natural, cultural and recreational values for which the Kicking Horse River was designated remain in good condition. The river and its surrounding environment continue to be managed to maintain and restore ecological integrity and provide outstanding visitor experiences for both roadside visitors and wilderness travellers. The designation as a Canadian Heritage River should remain in place.

References

Clarke, G.K.C., Jarosch, A.H., Anslow, F.S., Radić, V., and Menounos, B. 2015. Projected deglaciation of western Canada in the twenty-first century. *Nature Geoscience* 8, 372-377.

Parks Canada 2010. Yoho National Park of Canada Management Plan. 75p.

Parks Canada 2018. Yoho National Park of Canada State of the Park Assessment. 13p.

Parks Canada 2019. Yoho National Park State of the Park Report Technical Compendium. 197p.

Young, Michael K., Smith, Rebecca, Pilgrim, Kristine L., Isaak, Daniel J., McKelvey, Kevin S., Parkes, Sharon, Egge, Jacob, and Schwartz, Michael K. 2022. A molecular taxonomy of *Cottus* in western North America. *Western North American Naturalist*: Vol. 82: No. 2, Article 8.

Available at: <https://scholarsarchive.byu.edu/wnan/vol82/iss2/8>.