

## Patterdale Parish Community Flood Group

### Assessment of Impact of Wednesday 22<sup>nd</sup> November 2017 on Glenridding

#### Summary

On Wednesday 22<sup>nd</sup> November 2017 we had 115mm of rain in circa 24 hours. This had a significant impact on Glenridding Beck as well as further downstream. Key stats from the period as follows:

- Total Rainfall – 115mm
- Peak hourly rainfall – 19.2mm (11:00-11:59)
- Total Beck Depth Rise – 0.93m
- Max Depth rise in one hour – 0.22m (11:00-12:00)
- Total Ullswater Lake Level Increase – 0.82m
- Max depth of gravel deposit Glenridding Bridge – 0.45m

These are the sort of stats that we are trying to monitor with our “Monitoring Project” to get an idea of the impact of high rainfall levels on Glenridding Beck (and others). 115mm of rain is not an extreme event (we have had over 100mm of rain 4 times since Desmond). We therefore need to be very aware of the impact this has, and react to this. In this instance the flood defences at Glenridding held largely because of two simple factors:

- 1) The Lake level was low to start with and therefore the beck flowed freely
- 2) There was maximum clearance under Glenridding Bridge at the start (thanks to the removal of 30 tonnes of stone in October) and therefore at no time did the water stop flowing under the bridge and start backing up

Despite this there was significant gravel and stone dropped either side and under the bridge, and damage to the beck wall both below and above the bridge, which if not addressed will simply get worse over time.

The remainder of this document shows some of key stats from the day as well as photos taken on the 24<sup>th</sup> November when the bridge measurements were taken. A video from the 22<sup>nd</sup> November can be seen at [http://parishfloodgroup.org/flood-videos.html#nov\\_2017\\_rainfall](http://parishfloodgroup.org/flood-videos.html#nov_2017_rainfall)

#### Suggested next steps

- EA to verify gravel level readings as below
- EA to remove gravel above, below and under bridge back to pre-event levels
- EA to repair damaged beck wall above and below bridge
- EA to build proper beck wall from recycling centre down
- CFG to pollard trees freshly undermined above Village Hall
- CFG to review gravel levels at Glenridding Beck mouth

**We formally request that the above actions are addressed now while the EA are still on site and before we get any further extreme weather this winter. In 2018 we also need to stabilise the gravel between Gillside and Greenside**

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## Statistics

Greenside Rain Gauge (courtesy LDNP)			Glenridding Beck Depths (courtesy EA)			Steamer Pier Ullswater Depth (courtesy EA)		
Date	Time	Rain (mm)	Time	Depth (m)	Change	Time	Depth (m)	Change
21/11/2017						15:00	0.77	
22/11/2017	04:00-04:59	0.2						
22/11/2017	05:00-05:59	0.4						
22/11/2017	06:00-06:59	2						
22/11/2017	07:00-07:59	4.2	07:00	0.19	0			
22/11/2017	08:00-08:59	5.2						
22/11/2017	09:00-09:59	10				09:45	0.88	0.11
22/11/2017	10:00-10:59	13.8	10:00	0.43	0.24			
22/11/2017	11:00-11:59	19.2	11:00	0.65	0.22			
22/11/2017	12:00-12:59	14.4	12:00	0.84	0.19			
22/11/2017	13:00-13:59	10.2	13:00	1.02	0.18			
22/11/2017	14:00-14:59	11.8	14:00	1.05	0.03			
22/11/2017	15:00-15:59	4.4	15:00	1.12	0.07	14:45	1.15	0.27
22/11/2017	16:00-16:59	1.4	16:00	1.03	(0.09)			
22/11/2017	17:00-17:59	2	17:00	0.92	(0.11)			
22/11/2017	18:00-18:59	1.2						
22/11/2017	19:00-19:59	1.6						
22/11/2017	20:00-20:59	1.2						
22/11/2017	21:00-21:59	4.6						
22/11/2017	22:00-22:59	3.2						
22/11/2017	23:00-23:59	0.2						
23/11/2017	00:00-00:59	0.4						
23/11/2017	01:00-01:59	0.4						
23/11/2017	02:00-02:59	1						
23/11/2017	03:00-03:59	1.8						
23/11/2017	04:00-04:59	0						
23/11/2017	05:00-05:59	0.2						
23/11/2017	06:00-06:59	0				06:00	1.58	0.43
	<b>Total</b>	<b>115</b>				09:45	<b>1.50</b>	<b>0.01</b>
<b>Total</b>	<b>Rainfall</b>	<b>115 mm</b>	<b>Total Depth Rise</b>	<b>0.93 m</b>		<b>Total Depth Rise</b>	<b>0.82 m</b>	

Clearance Under Glenridding Bridge (upstream - courtesy of CFG)			
	22-Oct	24-Nov	Difference
Distance	Depth	Depth	Plus / (Minus)
0 m	1.8 m	1.75 m	(0.05) m
1 m	1.9 m	1.85 m	(0.05) m
2 m	1.9 m	1.85 m	(0.05) m
3 m	1.85 m	1.65 m	(0.20) m
4 m	1.75 m	1.45 m	(0.30) m
5 m	1.75 m	1.35 m	(0.40) m
6 m	1.7 m	1.3 m	(0.40) m
7 m	1.55 m	1.3 m	(0.25) m
8 m	1.55 m	1.2 m	(0.35) m
9 m	1.54 m	1.102 m	(0.44) m
10 m	1.55 m	1.1 m	(0.45) m

## Assessment of Impact of Wednesday 22<sup>nd</sup> November 2017 on Glenridding

Glenridding Bridge Depth Marker – “Right Hand Side” looking downstream



### Suggested Action

Removal of new gravel deposit to pre-22<sup>nd</sup> November levels



## Assessment of Impact of Wednesday 22<sup>nd</sup> November 2017 on Glenridding

Glenridding Bridge Depth Marker – “Left Hand Side” looking downstream



Glenridding Bridge Looking Upstream



### Suggested Action

Removal of new gravel deposit to pre-22<sup>nd</sup> November levels – no action needed on “Right Hand Side”

## Assessment of Impact of Wednesday 22<sup>nd</sup> November 2017 on Glenridding

Fresh Deposits Downstream of Glenridding Bridge



Glenridding Bridge From Downstream



### Suggested Action

Removal of new gravel deposit to pre-22<sup>nd</sup> November levels



## Assessment of Impact of Wednesday 22<sup>nd</sup> November 2017 on Glenridding

New Hole in Wall on Sailing Centre Drive downstream of Glenridding Bridge with inset – the stone further downstream



### Suggested Action

Repair of beck wall to prevent further erosion and collapse of beck bank

## Assessment of Impact of Wednesday 22<sup>nd</sup> November 2017 on Glenridding

Glenridding Bridge From Upstream



Glenridding Beck Looking Upstream towards TIC – fresh deposits



### Suggested Action

Removal of new gravel deposit to pre-22<sup>nd</sup> November levels



## Assessment of Impact of Wednesday 22<sup>nd</sup> November 2017 on Glenridding

Fresh beck wall collapse above TIC



### Suggested Action

Repair of beck wall to prevent further erosion and collapse of beck bank

### Beck Edge by Recycling Centre Glenridding



### Suggested Action

Proper build up of beck bank from recycling centre down



## Assessment of Impact of Wednesday 22<sup>nd</sup> November 2017 on Glenridding

Freshly undermined tree towards Gillside above Village Hall



Fresh Beck Bank Scour towards Gillside above Village Hall



### Suggested Action

CFG to pollard trees which have been undermined to prevent collapse into beck and potential bridge blockers

## Assessment of Impact of Wednesday 22<sup>nd</sup> November 2017 on Glenridding

Freshly completed CFG/LDNP work on Gillside Footpath



### Suggested Action

No action required – work held up admirably.