

Bolton Climate Change Risk log							note: 5-level impact scoring		
Ref	Climate Pressure	Short Name	Description of risk/opportunity	Who's affected	Actions in place	Recommended actions	Risk Score		Risk owner
							Likelihood	Impact	
1	Wetter winters	Sport/rec facilities closed (flooding)	Closure of sports/recreational facilities due to water logged/flooded ground.	sports/recreational users; grounds maintenance teams			C	IV	
2	Wetter winters	Opportunity to store water for summer	Greater potential to store water for summer use.	householders, businesses, organisations, UU		regular support for garden storage; advice/support for rainwater harvesting	B	IV	
3	Wetter winters	Traffic accidents caused by flooding	Increased incidences of traffic accidents caused by flooding.	road users, 999s		review hotspot locations for consideration of actions such as defensive measures, changed layout, options for advice to motorists	D	III	
4	Wetter winters	Increased erosion.	Increased erosion.	landowners, ecology	<ul style="list-style-type: none"> - River Croal Restoration Project: LWT submitted EOI to Catchment Restoration Fund to increase riparian habitat management and reduce blockages in the system; - EA & Irwell Rivers Trust assessing removal of weirs along Croal; - EA already removing weirs along Eagley Brook; - River Restoration Centre report available for Bradshaw Brook and major tributaries which identifies key priorities; - LWT producing Landscape Management Plan for Smithills Moor (to identify actions to reduce risk of erosion from this area) 	<ul style="list-style-type: none"> - Improve condition of riparian corridor to reduce sensitivity of bank habitats to erosion; - Undertake management work to control extent of Himalayan Balsam in areas identified as erosion hot spots; - Reduce major in-channel obstructions (weirs) along river network to improve sediment management along rivers, to improve ecological value & reduce flood risk; - Increase management of Smithills Moor to reduce risk of significant erosion of peat which will flow into downstream habitats 	B	III	
5	Wetter winters	Economic loss (wet weather)	Loss of economic activity, visitors, shoppers deterred by the wet weather. (tourism, shops)	businesses		businesses & Ec Strategy to plan and market accordingly	C	IV	
6	Extreme events: Flooding	Increased risk of flooding	Increased risk of flooding (includes damage to property/assets; psychological impacts of losses/damage)	All	<ul style="list-style-type: none"> - Council & NHS Flood Plan (focused on asset protection) - 2009 Greater Manchester Resilience Forum's Strategic Multi Agency Flood Plan - River Croal Restoration Project: LWT submitted EOI to EA for Catchment Restoration Fund to increase riparian habitat management & reduce blockages in the system; - EA & Irwell Rivers Trust assessing removal of weirs along Croal; - EA already removing weirs along Eagley Brook; - River Restoration Centre report available for Bradshaw Brook and major tributaries which identifies key priorities; - LWT producing Landscape Management Plan for Smithills Moor which will help to identify actions required to prevent flashy runoff from this system - WFD Irwell Pilot (various aims inc water quality and flood resilience) - LWT management of LNRs in Bolton: includes wetland management that acts as flood storage 	<ul style="list-style-type: none"> - Consideration of small-scale risks on individuals/local areas - Re-connection of floodplains to the river to increase the flood storage capacity of system; - Re-connect the river with formerly associated wetland areas (leats / old meanders) to increase the flood storage capacity of the system; - Removal of in-channel obstructions to improve the natural flow of the river 	C	III	
7	Extreme events: All	Opportunities/changes caused by extreme events	More windblown trees fallen trees, coppice management, potential wildlife opportunity?	All		Review method of woodland management - potential of pollarding?; Identify woodlands which may be more sensitive to extreme events	C	V	
8	Extreme events: All	Service disruption (extreme events)	Pressure/disruption on services, fallen trees, blocked roads. (Staff can't get to work, users can't access services (vulnerable users)	Commuters, businesses			C	III	
9	Extreme events: All	Emergency services under pressure	Emergency services under pressure	service users, 999 staff & budgets	(presumption that emergency plans make appropriate provision for service inundation)		E	II	
10	Extreme events: All	Increased cost of insurance premiums	Increased cost of insurance premiums	All			A	III	
11	Extreme events: Cold	More potholes	More potholes	road users, highways authorities			B	IV	
12	Extreme events: heat	Road damage (softening)	Road damage (softening)	road users, highways authorities	<---- different materials for surfacing ----> (slow roll-out?)		B	IV	
13	Extreme events rain	Damage to infrastructure	Damage to infrastructure	Infrastructure owners, users			B	IV	

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14	Extreme events rain	Water quality impacts	Impact on water quality- pollution incidents, soil erosion.	All	<ul style="list-style-type: none"> - LWT & BCV partnership with Bolton Council, working to increase extent & quality of reedbed habitats at Doffcocker Lodge, to increase ability of site to remediate diffuse pollution incidents; - LWT continuing to manage connected wetland areas including Seven Acres reedbed habitats to increase ability of site to remediate diffuse pollution incidents; - Croal Restoration Project: LWT's EOI submission to EA for project to adapt river corridor to flood/water quality issues from diffused pollution (inc highways) (includes BMBC, EA & Irwell River Trust partners) - LWT producing Landscape Management Plan for Smithills Moor to identify actions for better management & reduce soil erosion - WFD Irwell Pilot (various aims inc water quality and flood resilience) - LWT management of LNRs in Bolton: includes wetland management that helps to attenuate pollutants 	<ul style="list-style-type: none"> - Re-connecting areas for flood storage (see above) & improvement of the riparian corridor will help reduce diffuse pollution entering main channel & attenuate quantity of pollutants during high flow; - assessment required to identify where offline & online reedbed habitats can be created to remediate diffuse / point source pollution, & then these need installing 	C	IV	
15	Warmer summers	Increased HVAC costs	Increased cooling/ venting costs (especially businesses)	businesses, schools & organisations			B	IV	
16	Warmer summers	BAP priority species/habitats lost	BAP Priority species and habitats will be lost (Impact on biodiversity).	ecology	<ul style="list-style-type: none"> - LWT and various other partners undertake work to improve, enhance and create new areas for wildlife to thrive and expand; - LWT management of LNRs in Bolton: includes wetland management that provides species diversity to help species migration & to help prevent species loss. 	A more co-ordinated management approach is needed for the River Croal and its tributaries to ensure that a Living Landscape approach is adopted	C	III	
17	Warmer summers	Opportunity: easier for food growing	Opportunity: Increased capacity for food growing.	agriculture, householders, allotment holders		Identify new areas for food growing in the Borough?; Review how increased food supplies can be utilised locally in the Borough - i.e. discussions with markets	C	IV	
18	Warmer summers	Opportunity: Increased tourism?	Opportunity: Increased tourism?	businesses	LWT leading a HLF Landscape Partnership bid for the West Pennine Moors, including Smithills Moor, which will help to increase tourism in this area	<ul style="list-style-type: none"> - Investment in the strategic recreation routes along our river corridors to offer a better quality experience for tourists; - More promotion of the opportunities available in the Borough, particularly linked to the natural environment; - Ensure the Borough engages with the proposed Three Towers Project for the West Pennine Moors 	C	V	
19	Warmer summers	Opportunity: more biodiversity	Opportunity: more favourable climate for biodiversity	ecology	<ul style="list-style-type: none"> - HLF Landscape Partnership bid would help maximise biodiversity benefits for West Pennine Moors; - EOI to Catchment Restoration Fund would help to increase ability of wildlife to migrate along the corridor 	A co-ordinated review of the existing value of the natural environment in Bolton and an assessment of potential management changes that need to be made to maximise biodiversity benefits	C	IV	
20	Warmer summers	Risk of heat stress (workers)	Risk of skin cancer, or heat stress, highway workers (see No23)	highways/utilities staff & similar	NHS Bolton Heatwave Plan (inc Heat Health Watch system), includes responsibilities for NHS Bolton, NHS Foundation Trust, RBH, BMBC)		D	V	
21	Warmer summers	risk of heat stress (vulnerable adults)	Risk of heat stress to vulnerable people (underlying medical issues; elderly people - more alone)	vulnerable adults	NHS Bolton Heatwave Plan (inc Heat Health Watch system), includes responsibilities for NHS Bolton, NHS Foundation Trust, RBH, BMBC)	'Snow Angels'	C	III	
22	Warmer summers	risk of heat stress (children)	Risk of heat stress to vulnerable people (Young people - quick onset of ill-health in young)	children	NHS Bolton Heatwave Plan (inc Heat Health Watch system), includes responsibilities for NHS Bolton, NHS Foundation Trust, RBH, BMBC)	Work needs to be undertaken to increase the engagement of children and families with the natural environment	D	IV	
23	Warmer summers	increased risk of skin cancer	Increased risk of sunburn, especially skin cancer.	All	<ul style="list-style-type: none"> - Education by NHS Bolton (esp schools); - Sun Smart campaign (national) 	<ul style="list-style-type: none"> - Measures to reduce personal exposure to radiation (employers, schools, care orgs); - maintain public awareness 	B	III	
24			(removed - incorporated into No.27)						
25	Drier summers	Water shortages	Risk of water shortages, hosepipe bans.	All, Businesses, residents	<ul style="list-style-type: none"> a) United Utilities: building the east west pipeline; plus national programme of replacing old pipework, repairing leaks, winter water storage etc. b) The Core strategy contains policies that require (CG1,2,3)sustainable design and construction standards in new development. The sustainable design and construction SPD is being updated to be more user friendly. c) Groundwork give water efficiency advice to SMEs as part of the Enworks programme. d) LWT developing an education programme for schools called 'Water Detectives' with UU (not just Bolton). This introduces the importance of using water sensibly to children and their families. 	<ul style="list-style-type: none"> b) Revised SPD and engagement with developers on sustainability issues. e) Potential for more coordinated work on water efficiency in the home, ie tips and discounted water butts, hippos etc. 	C	IV	

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26	Drier summers	Moorland fires	More moorland fires, impacts on air quality, habitat damage and tourism. Loss of biodiversity (Red Moss and Smithills)	countryside/related management agencies; businesses; rural users; ecology	UU is implementing SCAMP 2 project to improve the management of a large area of West Pennine Moors which are the feeder for the main tributaries of the River Croal. SCAMP 2 will help to address flashy floods, water quality, etc. (Sustainable Catchment Management Programme). Which partly involves re-wetting the moors to sustain water level so there is less run off. LWT project at Smithills for better stewardship by working with landowners (part of a wider project developing Landscape Management Plan for Smithills Moor). GM fire and rescue have a CC adaptation plan. Red moss has a fire plan; and LWT manages Higher Level Stewardship programme at site to protect & enhance biodiversity value of Red Moss	- Implement recommendations of Landscape Management Plan for Smithills Moor (being produced by LWT at present); - Need to put more pressure on difficult tenants/landowners. Improved links between Red Moss & wider landscape to ensure more robust habitat for wildlife	B	III	
27	Drier summers	Air quality	Risk of poor air quality. Various diseases, esp. cardiopulmonary related; arising from chemical smog, cold still air, increased ozone levels in buildings, increased road use from tourism, etc	All, especially vulberable (ill, elderly, children)		For individual organisations:travel plan. Provide travel plan advice on websites, find out more about smarter choices programme , and what Bolton PCT are doing.	C	III	
28	Drier summers	impact iof dry summers of sports fields	Impact on grass sports surfaces (need watering or are unfit)	sports/recreational users; grounds maintenance teams			C	V	
29	Drier summers	pest/invasive species	Pest species and invasive species spread- more severe impact.	ecology	- LWT management of LNRs in Bolton: includes wetland management that provides species diversity to help species migration & to help prevent species loss. - existing responses to species such as Him.Balsam/Jap.Knotweed?	- Monitoring programme required; - Action plan developed based on monitoring results	C	IV	
30	Milder winters	Cost and damage from increased gritting.	Cost and damage from increased gritting.	highways authority; ecology; vehicle owners	- Croal Restoration Project: LWT's EOI submission to EA for project to adapt river corridor to flood/water quality issues from diffused pollution (inc highways) (includes BMBC, EA & Irwell River Trust partners)	Creation of offline & online reedbed habitats in areas identified as major diffuse pollution risk to remediate pollution	D	IV	
31	Milder winters	vector-borne diseases	Vector-borne diseases (inc malaria, Lyme disease). Limited natural malaria risk, but risk of treatment cases due to human migration.	All	- public health surveillance (regional HPA) for malaria & Lyme disease - public health warnings as/when necessary		C	IV	
32	Milder winters		Health impacts viruses, respiratory illnesses			risk removed			
33	Milder winters	Oportunity tourism/retail?	Oportunity tourism/retail?	businesses; community			C	V	
34	Warmer summers	Food poisoning (a)	Food poisoning (extreme/prolonged hot periods). The probability is that the no. of cases per annum will rise in association with ambient temperature events.	All	Environmental Services hygiene monitoring	-public education on food storage, handling, cooking & BBQs; - advice/enforcement in catering premises [check awareness/plans for heat events]	C	III	

2030

		Negligible V	Marginal IV	Serious III	Critical II	Catastrophic I
Very High	A			10		
High	B		2, 11, 12, 13, 15	4, 23, 26		
Significant	C	7, 18, 28, 33	1, 5, 14, 17, 19, 25, 29, 31	6, 8, 16, 21, 27, 34		
Low	D	20	22, 30	3, 35		
Very Low	E				9	
Almost Impossible	F					
Count		5	15	12	1	

Numbers within the matrix represent risk ID numbers in the main table

These are in numerical order, not necessarily order of priority

Count

1
8
18
5
1

Risk Appetite

- Highest combination of Risk (probability) & Impact (severity). - primary priority for action planning
- Medium level of combined Risk & Impact. - second (but not irrelevant) priority for action planning
- NB: Individual organisations may feature some risks more highly than this scoring matrix does

		10 Increased cost of insurance premiums
2 Opportunity to store water for summer 11 More potholes 12 Road damage (softening) 13 Damage to infrastructure 15 Increased HVAC costs	4 Increased erosion. 23 increased risk of skin cancer 26 Moorland fires	
1 Sport/rec facilities closed (flooding) 5 Economic loss (wet weather) 14 Water quality impacts 17 Opportunity: easier for food growing 19 Opportunity: more biodiversity 25 Water shortages 29 pest/invasive species 31 vector-borne diseases	6 Increased risk of flooding 8 Service disruption (extreme events) 16 BAP priority species/habitats lost 21 risk of heat stress (vulnerable adults) 27 Air quality 34 Food poisoning (a)	
22 risk of heat stress (children) 30 Cost and damage from increased gritting.	3 Traffic accidents caused by flooding 35 Food poisoning (b)	