MAKE YOUR STREAM MONITORING DATA COUNT!

A national quality assurance framework for community-based monitoring in Aotearoa New Zealand

Kia ora, welcome to the Monitoring and Quality Plan workbook for community-based monitoring (CBM)

This workbook contains seven forms (in separate tabs) to record important details of your CBM group's stream monitoring.
Completing these forms will help to organise your group's monitoring efforts and ensure your monitoring will be fit for purpose.

Some of the details on these forms are needed to support customising the ArcGIS Survey123 electronic field forms your CBM group may wish to use.
Some details also represent "minimum information requirements" if you want others, including your council or other organisations, to consider using

The forms have been designed so that the minimum information requirements are automatically populated in a separate form at the end, Form H.
Only Form H needs to be shared with others if you wish to keep private other details of your monitoring plan (e.g., site access, names).

How to use this workbook

Use sections 3 to 5 of the CBM QA guidance document to help you complete this template.
External assistance is recommended and is essential if your group is collecting data to inform regulatory processes.

The forms are organised from A to H to capture the key components of your Monitoring and Quality Plan. Print the forms for a written record.

START WITH FORM A - your monitoring purpose should determine whether you then select your sites or your indicators.

A: Monitoring purpose	This form captures your reason(s) for monitoring and what you will do with your data
B: Monitoring sites	This form captures details of your monitoring sites, including site access
C: Stream health indicators	This form captures what indicators you will monitor
D: Measurement methods	This form captures how you will measure your selected stream health indicators
E: Training & quality checks	This form captures the practices and checks you will put in place to ensure your measurements are robust
F: Monitoring frequency and timing	This form captures how often you will monitor and any special conditions for monitoring (e.g., weather)
G: Roles, responsibilities and review	This form captures information on who will do what in your programme, and any review of your plan
H: Essential data re-use information	This form automatically captures the relevant details you have entered into the forms above.

Minimum essential information requirements to support use of your data are in bold blue font and marked with an asterisk (*)

Note: Many questions have a dropdown list to select your response from - simply click anywhere on the white cell where your answer is to be entered and this will bring up this symbol . Then click on the symbol to bring up the list of options to select from. If you select an incorrect option in a cell and can't exit the cell without a warning box popping up, right click on the cell and select "Clear cell".

Form A: Monitoring purpose

CBM QA guidance reference: Section 3, pages 19-20

The reason or purpose for monitoring is the most important part of your monitoring and quality plan. Identify your monitoring purpose first because this will determine what stream health indicators you monitor or where you monitor, as well as when and how. Look at what information you already have or can get from others on your stream and catchment to help you identify your monitoring purpose.

CBM group name* Golden Stream Care Group *Your group name will automatically populate on all other forms*

1. Why are you interested in monitoring your particular stream(s)?

Select one or more options - click on the relevant box(es).

- [x] To understand its current state or condition
- [ ] To track changes in its condition over time
- [ ] To see if restoration efforts are improving stream condition/health
- [x] To identify a source of pollution
- [ ] Other *(Enter)*

2. Are there any <u>specific</u> questions you want your monitoring to address?

List these questions below. Be as specific as possible as this will help with the next parts of this monitoring and quality plan.

(e.g., Do nitrate-nitrogen concentrations meet guidelines for aquatic life? How high does water temperature get at site X? Do the invertebrates present indicate the stream is healthy?)

What macroinvertebrates live in our stream?

Is upstream farmland drainage impacting stream health?

3. What do you hope to achieve from your monitoring (i.e., what are your overall goals)?

We want to better understand the current ecological health of the stream and what may be impacting it.

4. Who will use the data you collect?*

Click on the white cell below and select one of the options from the dropdown list by clicking on the symbol that will appear.

It will be used by me/our monitoring group and shared with council/other organisations for their potential use

5. Do you support your data being considered for use in national environmental reporting and other applications?*

Click on the white cell below and select one of the options from the dropdown list.

Yes

6. If you answered "no" or "maybe/unsure" to question 5, please briefly record why you don't want to share your data with others.

Form B: Monitoring sites

CBM QA guidance reference: Section 3, pages 21-23

List the stream site locations at which you intend to monitor.
If your monitoring purpose is more focussed on an indicator than a specific site, you may wish to complete Form C (Monitoring indicators) first.
A site visit should be made to confirm safe access is possible, that the site is suitable for monitoring your indicators, and to capture the key details below.

CBM group name* Golden Stream Care Group

Stream bank access: Identify the stream bank (true left (TLB) or true right (TRB)) by imagining or standing yourself facing downstream.

Site	**Site code***	**Site name***	**Site type*** *(Click on the cell and select from the dropdown list)*	**Location coordinates*** *WGS84 decimal format (as displayed Google Maps)*		**Stream bank access*** *(Enter TLB or TRB)*
	GS 1	*Golden Stream at Golden Bridge*	*Stream*	*41.30951*	*174.8211*	*TLB*
1	GS 1	Golden Stream at Golden Bridge	Stream	41.30951	174.8211	TLB
2	GS 2	Silver Drain below Golden Bridge	Drain	41.32456	174.6991	TRB
3	GS 3	Golden Stream 200 m downstream of Silver Drain	Stream	41.30888	174.7211	TLB
4						
5						
6						
7						
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Site selection and access information

The following information will provide an important record for your CBM group of the reasons for your site selection and how to safely access each site.

Site location access: Note landowner details if relevant and any procedure for accessing the site (e.g., Phone Jim Golden on XXXXX at least 48 hours prior for access via his back section).

Site code	**Site name**	**Reason for selection**	**Site location access notes**	**Specific Health & Safety notes**
GS 1	*Golden Stream at Golden Bridge*	*Mid catchment site in main urban area*	*Access from public walkway beside 10 Murphy Street*	*Last section of walkway is slippery after rain*
GS 1	Golden Stream at Golden Bridge	Upstream of the rural land area being drained via Silver Drain	Access from public walkway beside 10 Murphy Street	
GS 2	Silver Drain below Golden Bridge	Represents the drainage inputs from the rural land area	As above	Drain bank often slippery after rain.
GS 3	Golden Stream 200 m downstream of Silver Drain	Downstream of drain influence. Has similar features to the upstream site for a comparison	As above	

Key site characteristics

It is useful to record some basic details of your site. Click on each white cell to bring up access to a dropdown list - select the closest matching option from the list.
Ensure you also have a photo looking upstream and downstream of each site.

Stream bank: Identify the stream bank (left or right) by imagining yourself facing downstream.

Site code	Dominant streambed material *(Click on the cell and select from the dropdown list)*	Stream width at monitoring site *(Click on the cell and select from the dropdown list)*	Main adjacent land use		Presence of artificial structures		River Environment Classification (REC) class Click here to identify *(then select from dropdown lists below)*				
			True left bank	True right bank	True left bank	True right bank	Climate	Source of flow	Geology	Landcover	Reach ID
GS 1	*Rocks/gravel or concrete (hard-bottomed)*	*2-5 m*	*Urban - residential*	*Urban - residential*	*Stormwater/ discharge outfall*	*None*	*CW*	*L*	*HS*	*U*	*38874*
GS 1	Rocks/gravel or concrete (hard-bottomed)	2-5 m	Urban - residential	Urban - residential	Reinforced bank (concrete, rocks, wood)	None	CW	L	HS	P	38874
GS 2	Silt/mud or sand (soft-bottomed)	1-2 m	Urban - residential	Urban - mixed	Reinforced bank (concrete, rocks, wood)	Reinforced bank (concrete, rocks, wood)	CW	L	HS	P	38666
GS 3	Rocks/gravel or concrete (hard-bottomed)	1-2 m	Urban - residential	Urban - residential	Reinforced bank (concrete, rocks, wood)	None	CW	L	HS	P	38425

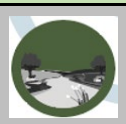
Form C: Monitoring indicators

CBM QA guidance reference: Section 3, pages 23-24 and Tables 4.1 to 4.4 of Section 4

Once you have identified your purpose for monitoring (Form A), you can identify the stream health indicators you wish to monitor.
You may need to check that your monitoring sites (Form B) are suitable for monitoring some indicators and decide if your chosen indicators will be measured at all sites.

CBM group name* Golden Stream Care Group

Enter YES in the column beside each of the national CBM framework stream health indicators you will measure.
Water temperature and dissolved oxygen can be selected as spot (discrete) and/or high frequency indicator measurements.
If your group is going to use a multi-sensor instrument to measure other water quality indicators at high frequency (e.g., turbidity), capture the details in the additional indicators table below and seek specialist advice on monitoring requirements and quality checks.

Stream health component	Indicator	We will measure*	Describe why this indicator is relevant to your monitoring purpose *(optional - recommended)*
Water quality *chemical & microbiological)* 	Water temperature		
	Water temperature (high frequency)		
	Dissolved oxygen		
	Dissolved oxygen (high frequency)		
	Visual water clarity	YES	We think the drain outflow may reduce water clarity and impact aquatic life downstream
	Turbidity		
	Suspended sediment		
	Electrical conductivity		
	pH		
	Ammoniacal nitrogen (NH_4-N)		
	Nitrate nitrogen (NO_3-N)		
	Dissolved inorganic nitrogen (DIN)		
	Total nitrogen (TN)		
	Dissolved reactive phosphorus (DRP)		
	Total phosphorus (TP)		
	Dissolved copper		
	Dissolved zinc		
	E. coli		
	Enterococci		
Aquatic life 	Periphyton	YES	Key indicator for aquatic life that may respond to nutrients in drain outflow and impact on macroinvertebrates
	Microcoleus (toxic algae)		
	Macrophytes		
	Macroinvertebrates	YES	Our primary indicator of interest for aquatic life
	Fish		
Habitat 	Physical habitat quality	YES	To check if physical habitat quality might account for differences in invertebrates upstream and downstream
	Deposited fine sediment	YES	Sediment is a major stressor for aquatic life and easy to measure
	Shade (canopy closure)		
	Rubbish (litter)		
Water quantity 	Water velocity		
	Stream flow		
	Rainfall		

List details of any additional stream health (or other) indicators you will measure below.

Indicator	Reason for monitoring

Form D: Measurement methods

CBM QA guidance reference: Section 3, pages 25-27 and Section 4

Once you have identified your purpose for monitoring (Form A), monitoring sites (Form B) and stream health monitoring indicators (Form C), you can identify your measurement methods.
Check that your measurement methods can be used at all of your monitoring sites.

CBM group name*: Golden Stream Care Group

For each of the stream health indicators listed below, identify the type of measurement you will make and select the relevant measurement method(s) you will use.
Also, where relevant, enter the make and model details of any field or flow measuring equipment you will use, including pH or nutrient test strips.

In addition to your selections in the table below, will you be collecting water samples for eDNA testing?*: Maybe

Stream health indicator	Type of measurement*	Measurement method*	Meter/instrument/test kit make and model*
	Click on the cell and select from the dropdown list		*(Only required for field meter or self-test kit measurements)*
Visual water clarity	Field measurement	Clarity tube	
Periphyton	Field measurement	Instream stone method (NIWA SHMAK)	
Macroinvertebrates	Self identification	Kick net method (riffle habitat only)	

Physical habitat quality	Field measurement	Rapid Habitat Assessment or RHA (recommended)	
Deposited fine sediment	Field measurement	Instream visual assessment	

Measurement method details for additional indicators from Form C

Stream health indicator (additional)	Type of measurement*	Measurement method*	Meter/instrument make and model* (if relevant)
0			
0			
0			
0			
0			
0			
0			
0			
0			
0			
0			

Additional notes on measurement methods (where relevant)

For example: 1)If you selected "other" for any measurement method above, enter the indicator and measurement method details.
2)If you plan to install a multi-sensor water quality instrument to measure indicators other than water temperature and DO at high frequency (e.g., electrical conductivity, pH, turbidity), enter the likely site location(s) and details of the sensor make and model for the indicators that will be measured.

Form E: Training and quality checks

CBM QA guidance reference: Section 3, pages 28-29 and Section 5

Describe the training and actions your group will carry out to provide confidence that the stream health monitoring data you collect will be fit for your intended purpose. Comment on the types and frequency of equipment checks, training and training refreshers received/planned, and internal and external checks you propose to carry out. **We strongly recommend you keep a record of the training your group members receive.**

CBM group name*	Golden Stream Care Group

Training

What training have the group members carrying out the stream monitoring already received?* (Select as many as apply)

Select YES or NO	Method	Name of training provider - resources/person/organisation
YES	Self-trained from stream monitoring manuals and/or videos	NIWA SHMAK User Manual and videos
YES	Trained by an experienced internal group member	Our equipment manager was once a field ecologist
NO	Training by a council land management officer, catchment or rural advisor	
YES	Training by a support organisation or catchment coordinator	Mountains to Sea Wellington (MTSW)
NO	Training by a scientist or technician from a council, crown research institute, university, consultancy or other organisation	
	Other (please describe below)	

If training has not been received as yet, or if more training is proposed for group members, describe that training* - who, what, when, etc.

MTSW are going to give us a field session to run through the measurement methods for our 5 selected indicators in October 2023 before we start our monitoring.

Describe what refresher training group members will receive* - who, what, when, etc.

We won't do any unless we continue to monitor on an ongoing basis.

Quality checks

Internal quality checks

Describe the internal quality checks (e.g., repeat measurements, field meter calibration) you will carry out as a group for each activity below - who, what, when, etc.

Field measurements

Two of our group are going to make each measurement independently and then will share the results. If they are within the accepted margin of difference suggested in the CBM guidance document we will take the average of the two results as our official measurement. Otherwise, a third measurement will be made.

Water sample collection for self or lab testing

Not applicable

Macroinvertebrate samples for lab identification (if relevant)

Not applicable

External quality checks

Describe the external quality checks (e.g., pairing up with another group or a professional to check your methods and measurements) you will have carried out of your group's monitoring activities - who, what, when, etc.

A MTSW coordinator will assess our performance on on our second sampling occasion.

Form F: Monitoring frequency and timing

CBM QA guidance reference: Section 3, pages 30-32

When and how often you monitor are important decisions that will depend on both monitoring purpose but also the time and resources you have. Consider the time of day, time of year and whether your monitoring needs to target specific stream or weather conditions. You also need to identify if and when you might stop monitoring.

CBM group name*

Golden Stream Care Group

Outline below how often you will monitor your selected stream health indicators

Stream indicator type	Frequency and timing	Monitoring conditions	Other notes
Water quality indicators	We will measure visual clarity fortnightly between 1 November and 30 April	We will measure regardless of weather conditions	
Water quantity indicators	Not applicable		
Aquatic life indicators	We will assess these indicators on three occasions between 1 November and 30 April	We will only do the assessments after a period of at least two weeks of settled weather and stream flows	
Physical habitat indicators	We will assess physical habitat quality and deposited sediment cover on each macroinvertebrate sampling occasion		

Outline when you intend to start monitoring and when you might finish

We will start in November 2023 and finish on 30 April. We will assess the results and then decide if we will repeat the monitoring from next summer or add additional indicators.

Form G: Roles, responsibilities and review

CBM QA guidance reference: Section 3, pages 33-34

There are many roles and responsibilities that come with maintaining a monitoring programme. It is important to share these responsibilities so that no one is overloaded.

CBM group name*	Golden Stream Care Group

Enter the name of the person(s) that will act as the primary point of contact for external organisations to connect with your group

CBM group contact*	Gabby Goldie
Contact email*	gabby.goldie123@gmail.com

Outline below the key roles and responsibilities or tasks for different group members as appropriate

Potential roles include monitoring coordinator, equipment manager, data manager, outreach/communicator, quality/training manager, monitoring team member, and health & safety coordinator.

Name	Position *(Click on the cell and select from the dropdown list)*	Task(s)	Other notes
Gabby Goldie	Monitoring coordinator	Organising monitoring schedules and liaison with MTST	
Sydney Silver	Quality/training manager	Assess data and oversee training	
Jenny Dwight	Monitoring team member	Take measurements	
Dan Brown	Monitoring team member	Take measurements	
Ces Black	Monitoring team member	Take measurements	

Assistance preparing or reviewing this Monitoring and Quality Plan

1. Briefly describe any help you have had in completing this Monitoring and Quality Plan*

Ruby Red from Mountains to Sea Wellington Trust assisted with the identification of a suitable upstream and downstream sampling sites.

2. Briefly note any external check/review made of this completed Monitoring and Quality Plan, including when*

Add name(s) and organisation plus a note if only specific checks were made.

Ruby Red checked over our completed draft plan, especially the measurements methods in July 2023.

3. Date this Monitoring and Quality Plan was finalised*

14-Aug-2023

Future reviews of this Monitoring and Quality Plan

It is important to periodically review your plan to ensure everything remains up to date and continues to meet your group's needs. **We recommend you do this at least once a year** and save the plan as a new version. Complete the review register below as part of the review so you have a summary record of review dates and key changes.

Review date	**Main changes made to the original plan** ***(include any reasons for a change and if you had any external help with your review)***

Form H: Essential Data Re-use Information

This form has autopopulated the essential information entered from Forms A to G needed to support the potential re-use of your group's stream monitoring data.

This form can be supplied to your regional council or other support organisation hosting the ArcGIS Survey123 electronic field form(s) you will use.
This summary form should also be made available to other groups or organisations that you wish to share your collected data with.

Note: A "0" is the default entry and will be replaced if information is entered into the relevant field from Forms A to G.

CBM group name	Golden Stream Care Group
CBM group contact	Gabby Goldie
CBM group contact email	gabby.goldie123@gmail.com
Intended user of the collected data	It will be used by me/our monitoring group and shared with council/other organisations for their potential use
Data can be used in national reporting or other applications?	Yes
Assistance received in completing Monitoring & Quality Plan	Ruby Red from Mountains to Sea Wellington Trust assisted with the identification of a suitable upstream and downstream sampling sites.
Completed Monitoring & Quality Plan checked/reviewed externally?	Ruby Red checked over our completed draft plan, especially the measurements methods in July 2023.
Date Monitoring & Quality Plan finalised	14-Aug-2023

Monitoring sites

Site	Site code	Site name	Site type	Easting	Northing	Stream bank access
1	GS 1	Golden Stream at Golden Bridge	Stream	41.30951	174.8211	TLB
2	GS 2	Silver Drain below Golden Bridge	Drain	41.32456	174.6991	TRB
3	GS 3	Golden Stream 200 m downstream	Stream	41.30888	174.7211	TLB
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0

15	0	0	0	0	0	0
16	0	0	0	0	0	0
17	0	0	0	0	0	0
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	0	0	0	0	0	0

eDNA water sample testing Maybe

Stream health indicators and measurement methods

Stream health indicator	Measurement type	Measurement method	Meter, instrument or test kit make and model
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Visual water clarity	Field measurement	Clarity tube	0
	0	0	0
	0	0	
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	
	0	0	0
	0	0	
	0	0	
	0	0	
	0	0	0
	0	0	
Periphyton	Field measurement	Instream stone method (NIWA SHMAK)	
	0	0	
	0	0	
Macroinvertebrates	Self identification	Kick net method (riffle habitat only)	
	0	0	
Physical habitat quality	Field measurement	Rapid Habitat Assessment or RHA	
Deposited fine sediment	Field measurement	Instream visual assessment	
	0	0	
	0	0	
	0	0	0
	0	0	0
	0	0	0

Additional/other monitoring indicators (if applicable)

Indicator	Type of measurement	Measurement method	Meter/instrument/test kit make and model *(where relevant)*
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Training already received		**Name of resources/person/organisation that provided the training**
YES	Self-trained from stream monitoring manuals and/or videos	NIWA SHMAK User Manual and videos
YES	Trained by an experienced internal group member	Our equipment manager was once a field ecologist
NO	Training by a council land management officer, catchment or rural advisor	0
YES	Training by a support organisation or catchment coordinator	Mountains to Sea Wellington (MTSW)
NO	Training by a scientist or technician from a council, crown research institute, university, consultancy or other organisation	0
0	Other (as described below)	
	0	

The following training (or additional training) is proposed

MTSW are going to give us a field session to run through the measurement methods for our 5 selected indicators in October 2023 before we

Details of proposed training refreshers

We won't do any unless we continue to monitor on an ongoing basis.