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WorldFish Carp Genetic Improvement Program Electronic Pond Book Guide

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About WorldFish
WorldFish is an international, nonprofit research organization that harnesses the potential of fisheries and aquaculture to reduce hunger and poverty. Globally, more than one billion poor people obtain most of their animal protein from fish and 800 million depend on fisheries and aquaculture for their livelihoods. WorldFish is a member of CGIAR, a global research partnership for a food-secure future.

Acknowledgments
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1. Introduction

WorldFish has developed an Electronic Pond Book in the form of a of Microsoft Excel workbook. The primary purpose of the Electronic Pond Book is to capture data relating to the management of all ponds used in the Carp Genetic Improvement Program (CGIP) in a single repository accessible by multiple users. Furthermore, it allows the tracking of fish movements and water movement among ponds. For each pond a current feed, fertiliser and treatments regime must be specified. Data entry errors are minimised through the specification of click down lists for many inputs.

Outputs include estimates of fish weight by pond and species, estimates of feed, fertiliser and treatments required in coming days and summaries of water chemistry, Secchi disc measurements, water depth, feed inputs, fertiliser inputs, water/pond treatments, weight of randomly sampled fish and mortalities by pond over time.

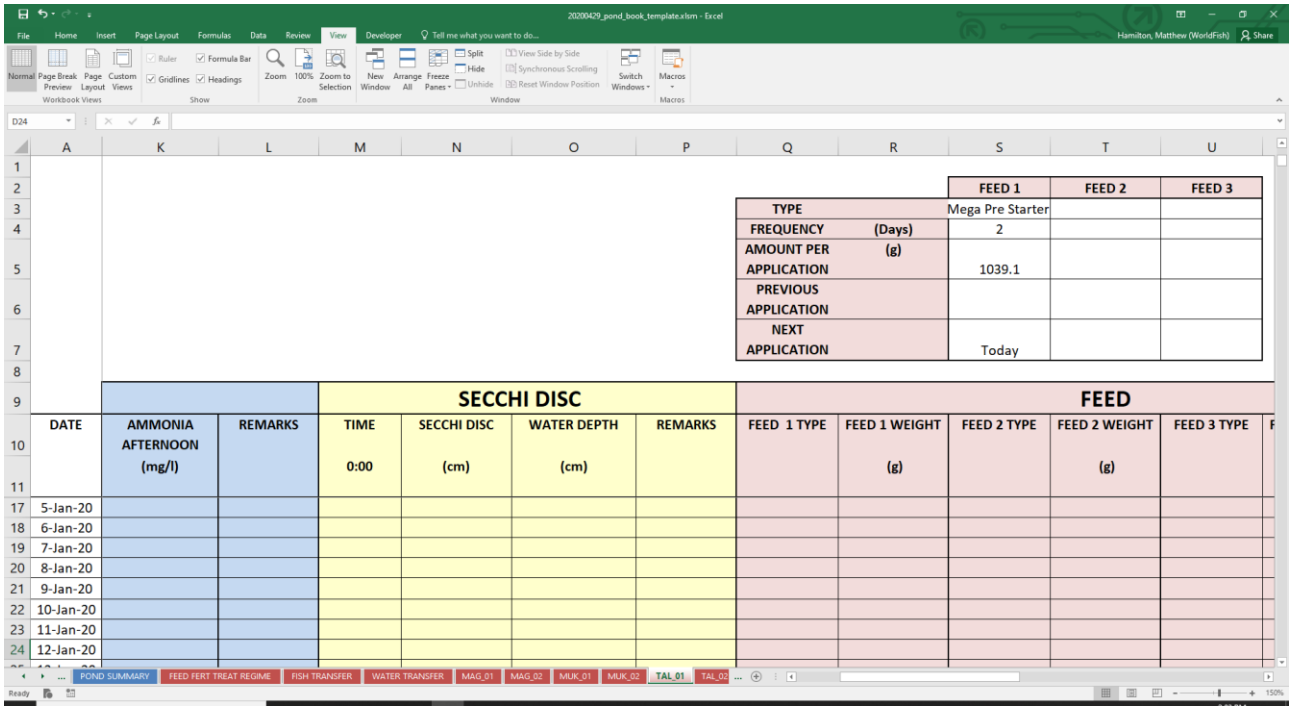
On a daily basis, an appointed member of the CGIP team will ensure that data has been is inputted appropriately into the CGIP pond sheet workbook and the file saved to a folder accessible by all relevant local and remote users.

2. Pond sheets

For each CGIP pond there is a sheet in the workbook. These sheets capture data inputs for water chemistry (pH, dissolved oxygen, temperature and ammonia) and other characteristics (Secchi disc measurement and water depth), feed inputs, fertiliser inputs, water/pond treatments, weight of randomly sampled fish and mortalities (on worksheet per pond). The names of these sheets correspond to ponds listed in the PONDS worksheet (Section 5).

Each pond sheet contains one row for each day in a year (Figure 1) and an additional row at the beginning of the year to capture data from the most recent random weight measurement. Not all cells need to be filled for each day. The data entered on any given day will be determined by the relevant Standard Operating Procedure, the current feed, fertiliser and treatment regime and the frequency of mortality events.

In addition to cells for inputs, at the top of each pond sheet feed, fertiliser and treatment recommendations are shown. These are derived from current feed, fertiliser and treatment regimes (Section 5), pond size (Section 6) and the most recent fish weight measurements.



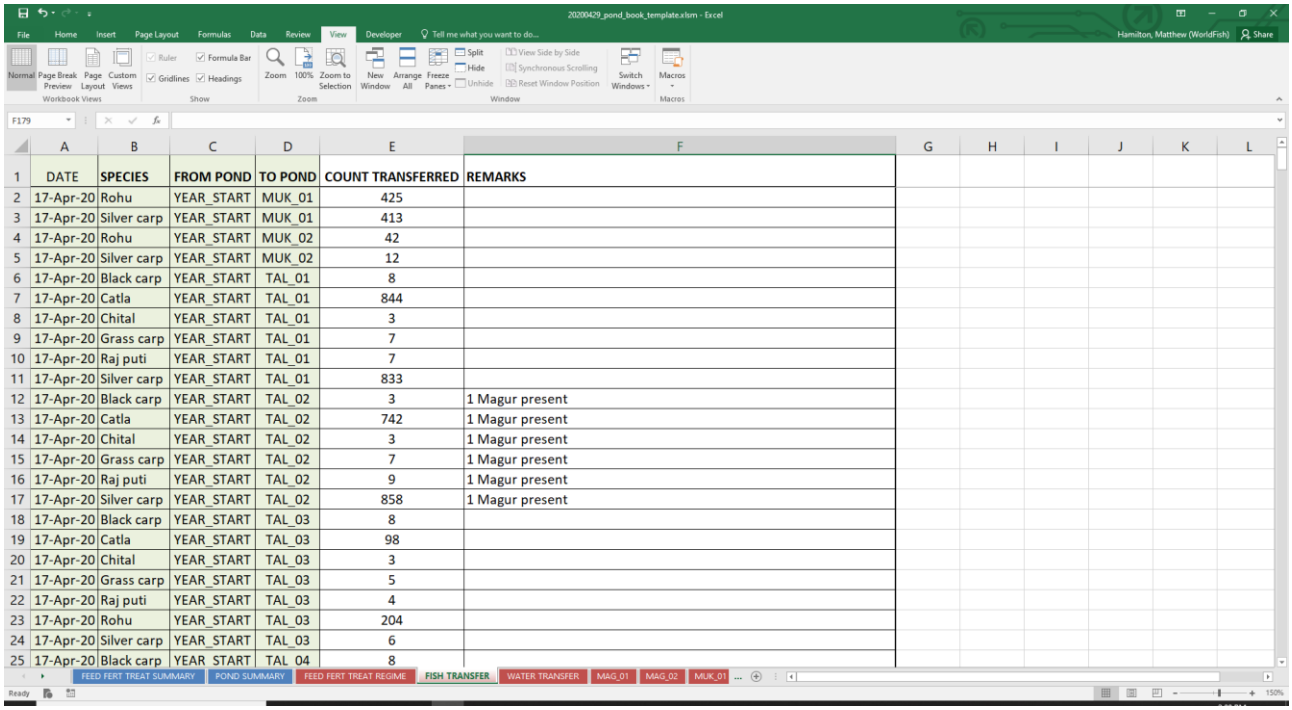
		FEED 1	FEED 2	FEED 3
TYPE		Mega Pre Starter		
FREQUENCY	(Days)	2		
AMOUNT PER APPLICATION	(g)	1039.1		
PREVIOUS APPLICATION				
NEXT APPLICATION		Today		

				SECCHI DISC				FEED					
DATE	AMMONIA AFTERNOON (mg/l)	REMARKS	TIME 0:00	SECCHI DISC (cm)	WATER DEPTH (cm)	REMARKS	FEED 1 TYPE	FEED 1 WEIGHT (g)	FEED 2 TYPE	FEED 2 WEIGHT (g)	FEED 3 TYPE	
5-Jan-20												
6-Jan-20												
7-Jan-20												
8-Jan-20												
9-Jan-20												
10-Jan-20												
11-Jan-20												
12-Jan-20												

Figure 1. Part of the TAL_01 pond sheet.

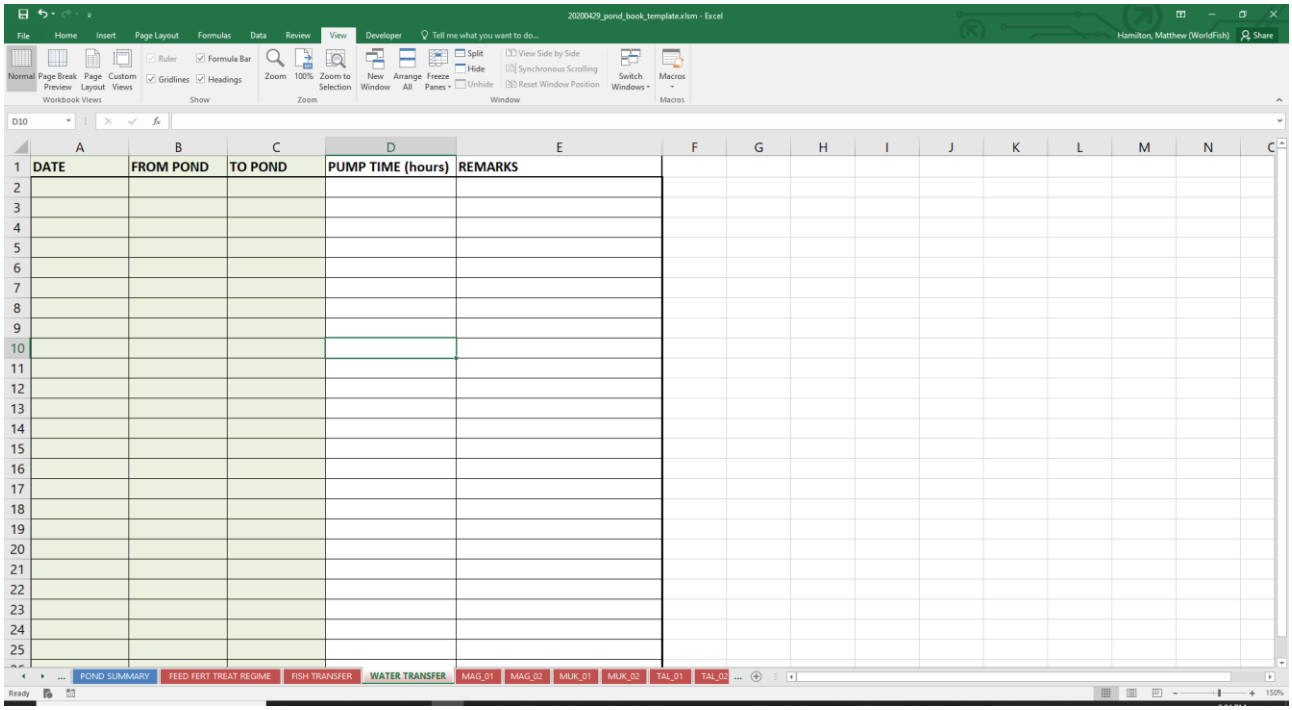
3. Tracking fish and water movements

The movement of fish and water among ponds is tracked using the 'FISH TRANSFER' (Figure 2) and 'WATER TRANSFER' (Figure 3) worksheets respectively. In the case of fish transfer, the number of each species transferred from one pond to another must be specified on a separate line.



	A	B	C	D	E	F
1	DATE	SPECIES	FROM POND	TO POND	COUNT TRANSFERRED	REMARKS
2	17-Apr-20	Rohu	YEAR_START	MUK_01	425	
3	17-Apr-20	Silver carp	YEAR_START	MUK_01	413	
4	17-Apr-20	Rohu	YEAR_START	MUK_02	42	
5	17-Apr-20	Silver carp	YEAR_START	MUK_02	12	
6	17-Apr-20	Black carp	YEAR_START	TAL_01	8	
7	17-Apr-20	Catla	YEAR_START	TAL_01	844	
8	17-Apr-20	Chital	YEAR_START	TAL_01	3	
9	17-Apr-20	Grass carp	YEAR_START	TAL_01	7	
10	17-Apr-20	Raj puti	YEAR_START	TAL_01	7	
11	17-Apr-20	Silver carp	YEAR_START	TAL_01	833	
12	17-Apr-20	Black carp	YEAR_START	TAL_02	3	1 Magur present
13	17-Apr-20	Catla	YEAR_START	TAL_02	742	1 Magur present
14	17-Apr-20	Chital	YEAR_START	TAL_02	3	1 Magur present
15	17-Apr-20	Grass carp	YEAR_START	TAL_02	7	1 Magur present
16	17-Apr-20	Raj puti	YEAR_START	TAL_02	9	1 Magur present
17	17-Apr-20	Silver carp	YEAR_START	TAL_02	858	1 Magur present
18	17-Apr-20	Black carp	YEAR_START	TAL_03	8	
19	17-Apr-20	Catla	YEAR_START	TAL_03	98	
20	17-Apr-20	Chital	YEAR_START	TAL_03	3	
21	17-Apr-20	Grass carp	YEAR_START	TAL_03	5	
22	17-Apr-20	Raj puti	YEAR_START	TAL_03	4	
23	17-Apr-20	Rohu	YEAR_START	TAL_03	204	
24	17-Apr-20	Silver carp	YEAR_START	TAL_03	6	
25	17-Apr-20	Black carp	YEAR_START	TAL_04	8	

Figure 2. Field in the FISH TRANSFER worksheet.

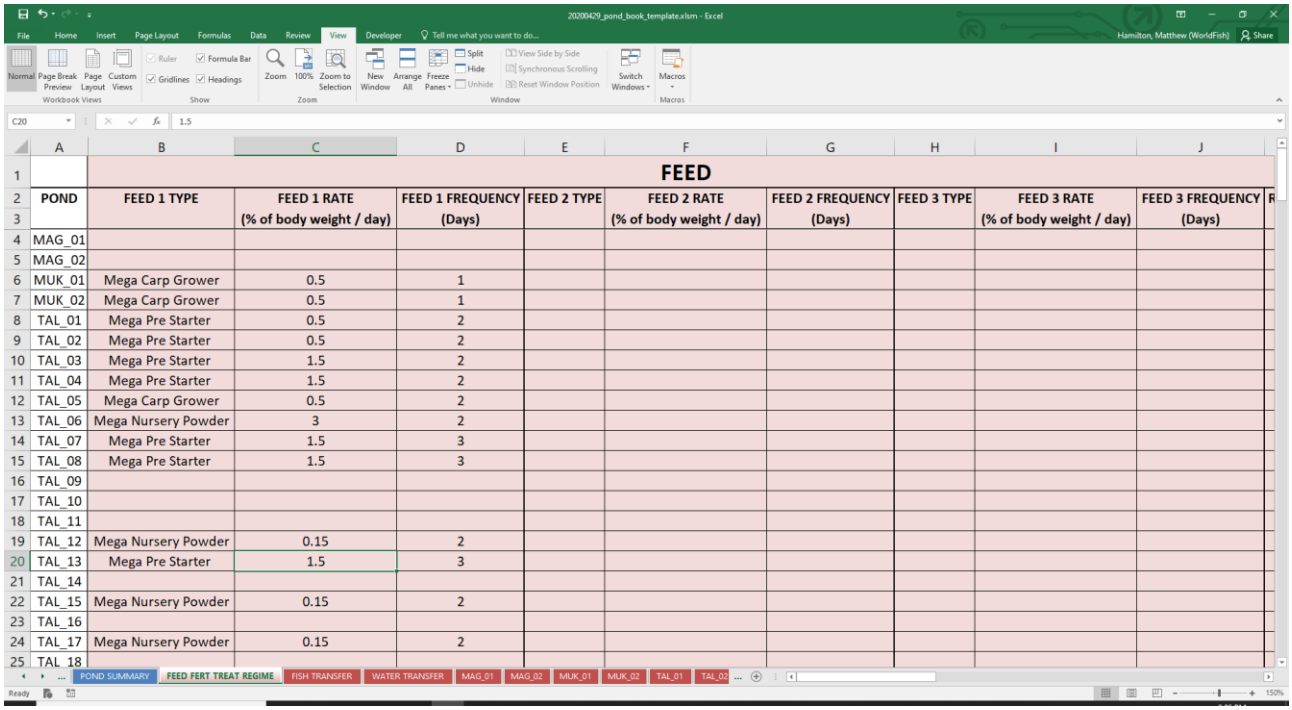


	A	B	C	D	E
1	DATE	FROM POND	TO POND	PUMP TIME (hours)	REMARKS
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

Figure 3. Fields in the WATER TRANSFER worksheet.

4. Specifying feed, fertiliser and treatment regimes

For each pond, the current feed, fertiliser and treatments regimes must be entered into the 'FEED FERT TREAT REGIME' worksheet (Figure 4). Up to 3 different feeds, fertilisers and treatments can be specified for each pond.

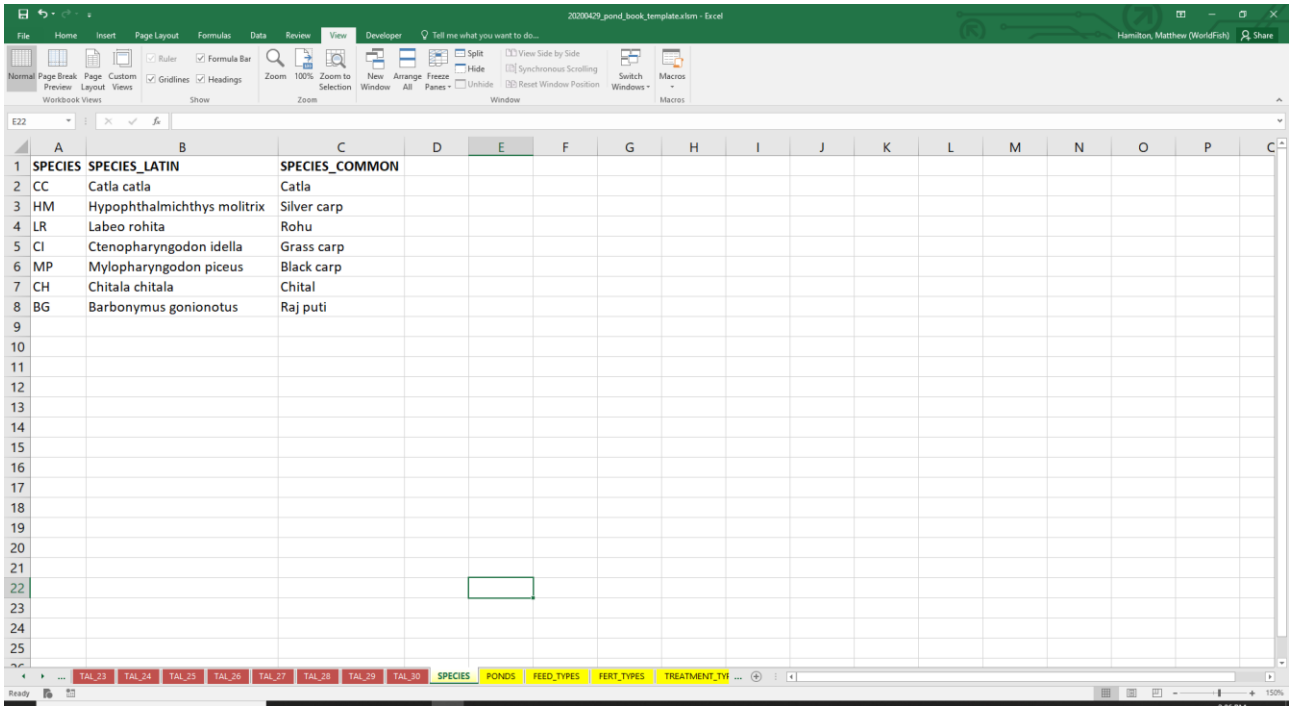


	A	B	C	D	E	F	G	H	I	J
1		FEED								
2	POND	FEED 1 TYPE	FEED 1 RATE (% of body weight / day)	FEED 1 FREQUENCY (Days)	FEED 2 TYPE	FEED 2 RATE (% of body weight / day)	FEED 2 FREQUENCY (Days)	FEED 3 TYPE	FEED 3 RATE (% of body weight / day)	FEED 3 FREQUENCY (Days)
4	MAG_01									
5	MAG_02									
6	MUK_01	Mega Carp Grower	0.5	1						
7	MUK_02	Mega Carp Grower	0.5	1						
8	TAL_01	Mega Pre Starter	0.5	2						
9	TAL_02	Mega Pre Starter	0.5	2						
10	TAL_03	Mega Pre Starter	1.5	2						
11	TAL_04	Mega Pre Starter	1.5	2						
12	TAL_05	Mega Carp Grower	0.5	2						
13	TAL_06	Mega Nursery Powder	3	2						
14	TAL_07	Mega Pre Starter	1.5	3						
15	TAL_08	Mega Pre Starter	1.5	3						
16	TAL_09									
17	TAL_10									
18	TAL_11									
19	TAL_12	Mega Nursery Powder	0.15	2						
20	TAL_13	Mega Pre Starter	1.5	3						
21	TAL_14									
22	TAL_15	Mega Nursery Powder	0.15	2						
23	TAL_16									
24	TAL_17	Mega Nursery Powder	0.15	2						
25	TAL_18									

Figure 4. Feed fields in the FEED FERT TREAT REGIME worksheet

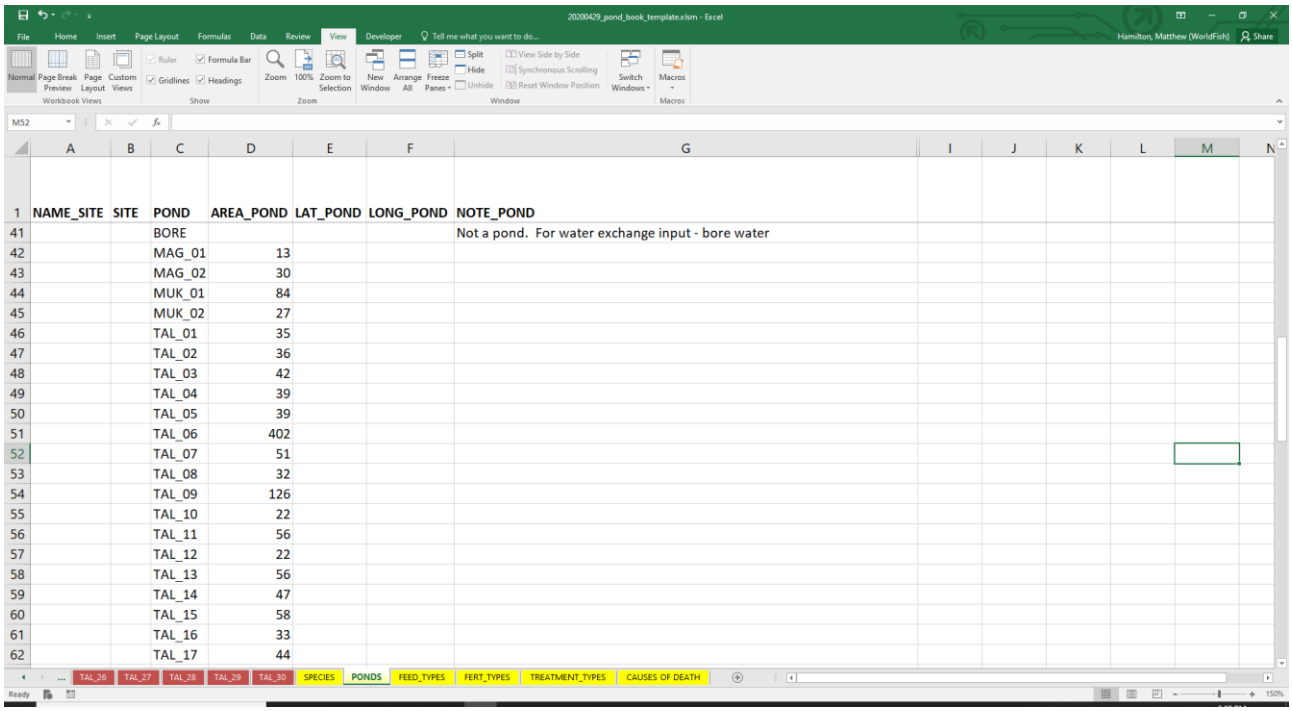
5. Minimising data entry errors

Additional worksheet (coloured yellow) provide options for click down lists in input worksheets (Sections 3 to 5). The use of click down lists in input sheets minimises errors, such as typos, and ensures that legitimate data is entered. These worksheet are coloured yellow and are entitled, 'SPECIES', (Figure 5) 'PONDS' (Figure 6), 'FEED TYPES' (Figure 7), 'FERT TYPES' (Figure 8), 'TREATMENT TYPES' (Figure 9) and 'CAUSES OF DEATH' (Figure 10). The content of these tabs should only be altered by an appointed member of the CGIP team. They should not be altered routinely and once a row has been added it should not be changed in any one year – additional rows should be added instead. These worksheets should be 'protected' and may be hidden from view to ensure they are not altered inappropriately.



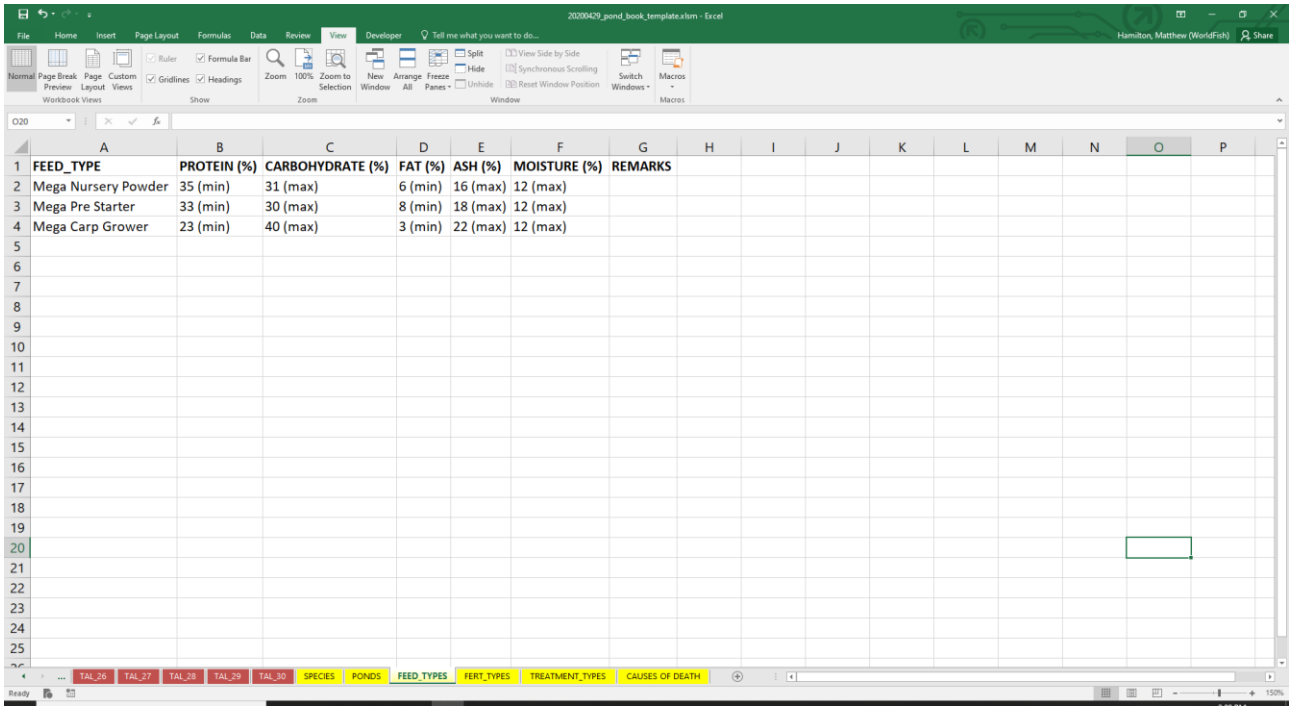
	A	B	C
1	SPECIES	SPECIES_LATIN	SPECIES_COMMON
2	CC	Catla catla	Catla
3	HM	Hypophthalmichthys molitrix	Silver carp
4	LR	Labeo rohita	Rohu
5	CI	Ctenopharyngodon idella	Grass carp
6	MP	Mylopharyngodon piceus	Black carp
7	CH	Chitala chitala	Chital
8	BG	Barbonymus gonionotus	Raj puti

Figure 5. Fields in the SPECIES worksheet.



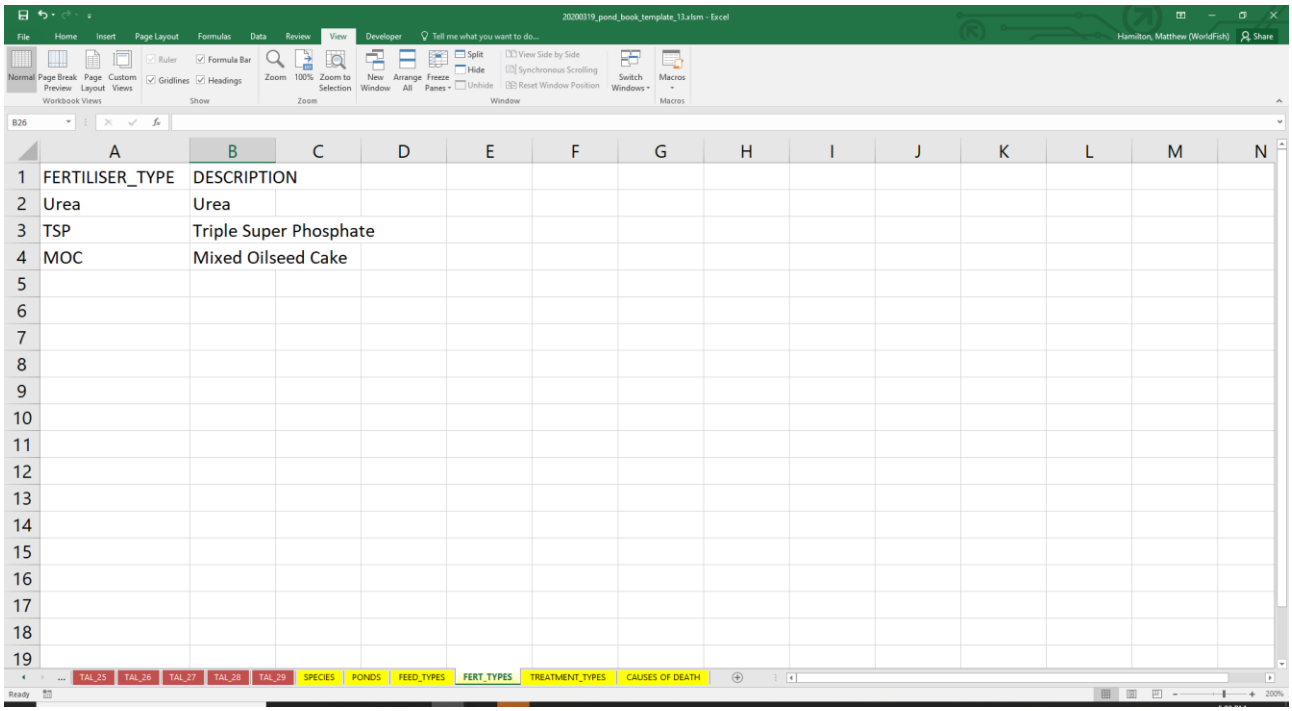
	NAME_SITE	SITE	POND	AREA_POND	LAT_POND	LONG_POND	NOTE_POND
41			BORE				Not a pond. For water exchange input - bore water
42			MAG_01	13			
43			MAG_02	30			
44			MUK_01	84			
45			MUK_02	27			
46			TAL_01	35			
47			TAL_02	36			
48			TAL_03	42			
49			TAL_04	39			
50			TAL_05	39			
51			TAL_06	402			
52			TAL_07	51			
53			TAL_08	32			
54			TAL_09	126			
55			TAL_10	22			
56			TAL_11	56			
57			TAL_12	22			
58			TAL_13	56			
59			TAL_14	47			
60			TAL_15	58			
61			TAL_16	33			
62			TAL_17	44			

Figure 6. Fields in the PONDS worksheet.



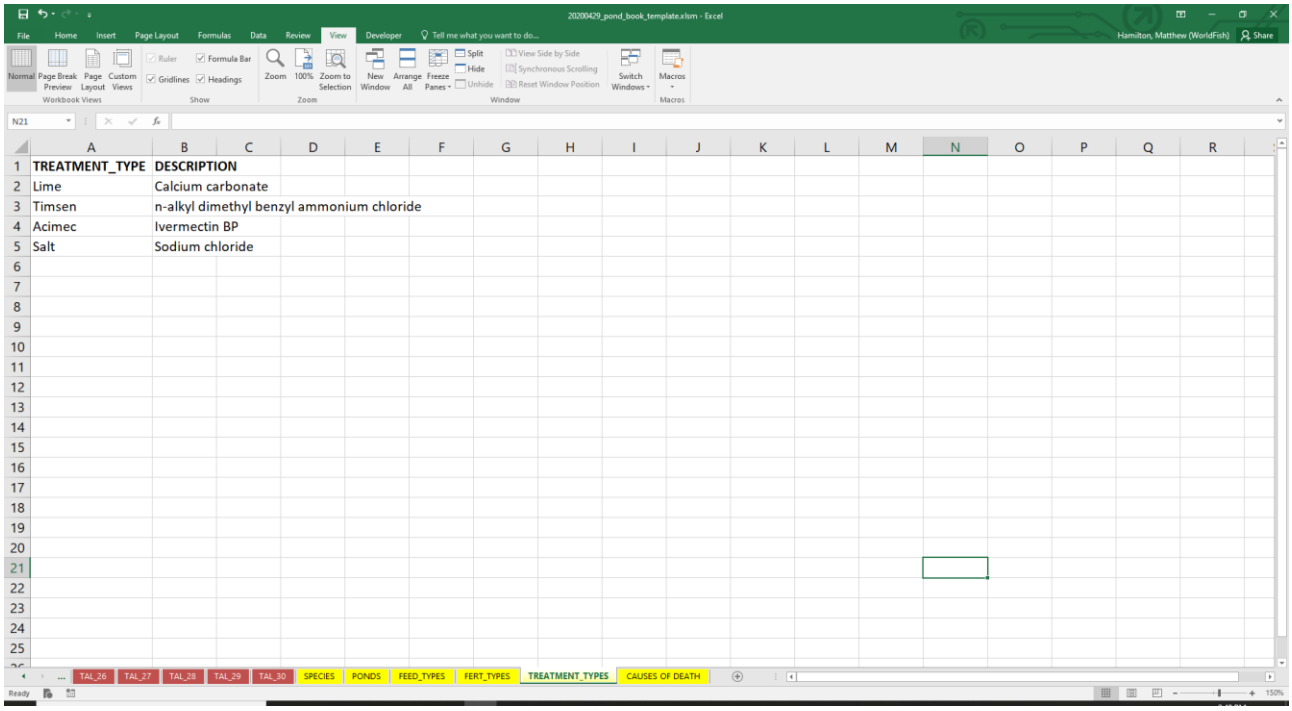
	FEED_TYPE	PROTEIN (%)	CARBOHYDRATE (%)	FAT (%)	ASH (%)	MOISTURE (%)	REMARKS
2	Mega Nursery Powder	35 (min)	31 (max)	6 (min)	16 (max)	12 (max)	
3	Mega Pre Starter	33 (min)	30 (max)	8 (min)	18 (max)	12 (max)	
4	Mega Carp Grower	23 (min)	40 (max)	3 (min)	22 (max)	12 (max)	

Figure 7. Fields in the FEED TYPES worksheet.



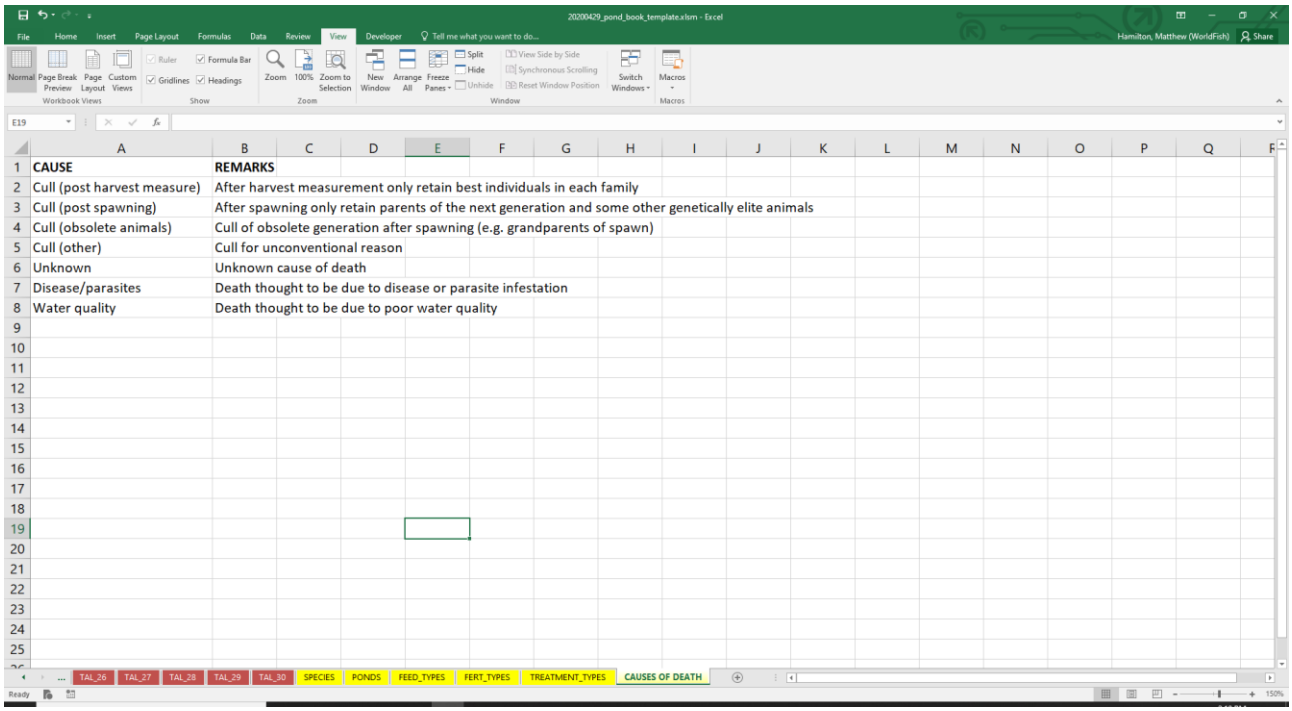
	A	B
1	FERTILISER_TYPE	DESCRIPTION
2	Urea	Urea
3	TSP	Triple Super Phosphate
4	MOC	Mixed Oilseed Cake

Figure 8. Fields in the FERT TYPES worksheet.



	A	B
1	TREATMENT_TYPE	DESCRIPTION
2	Lime	Calcium carbonate
3	Timsen	n-alkyl dimethyl benzyl ammonium chloride
4	Acimec	Ivermectin BP
5	Salt	Sodium chloride

Figure 9. Fields in the TREATMENT TYPES worksheet.



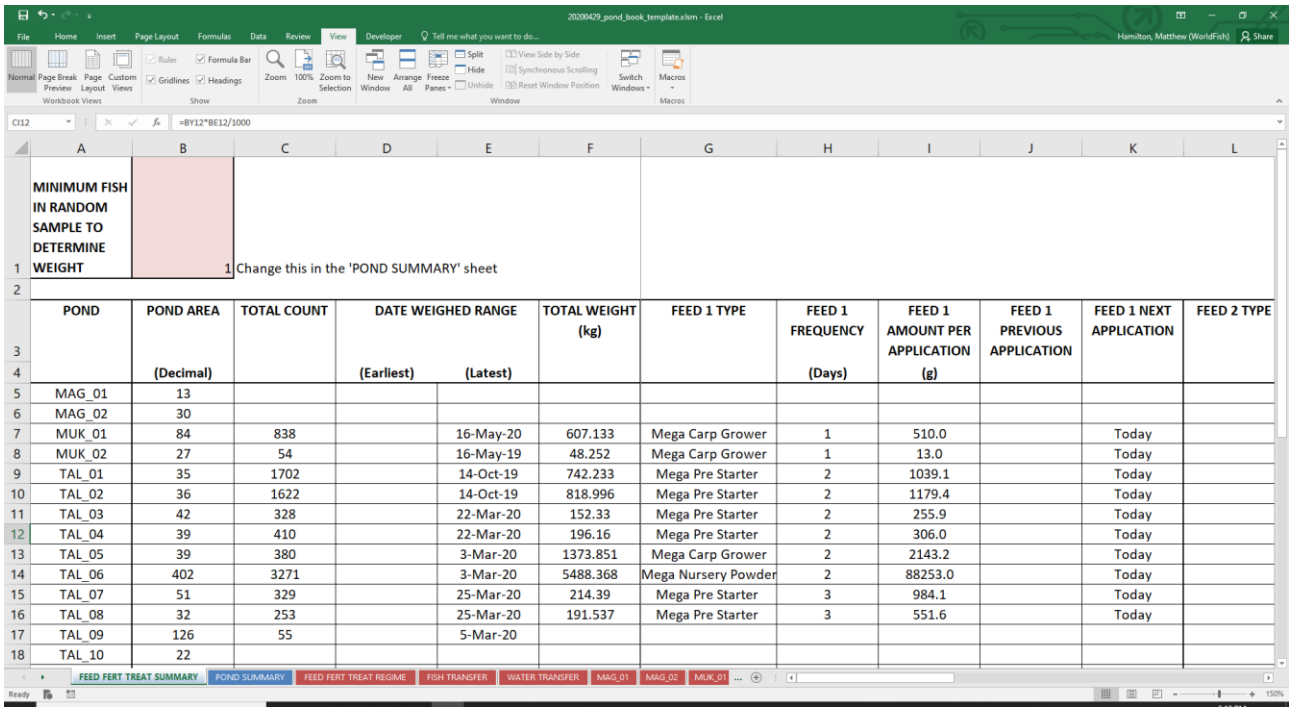
	A	B
1	CAUSE	REMARKS
2	Cull (post harvest measure)	After harvest measurement only retain best individuals in each family
3	Cull (post spawning)	After spawning only retain parents of the next generation and some other genetically elite animals
4	Cull (obsolete animals)	Cull of obsolete generation after spawning (e.g. grandparents of spawn)
5	Cull (other)	Cull for unconventional reason
6	Unknown	Unknown cause of death
7	Disease/parasites	Death thought to be due to disease or parasite infestation
8	Water quality	Death thought to be due to poor water quality

Figure 10. Fields in the CAUSE OF DEATH worksheet

6. Outputs

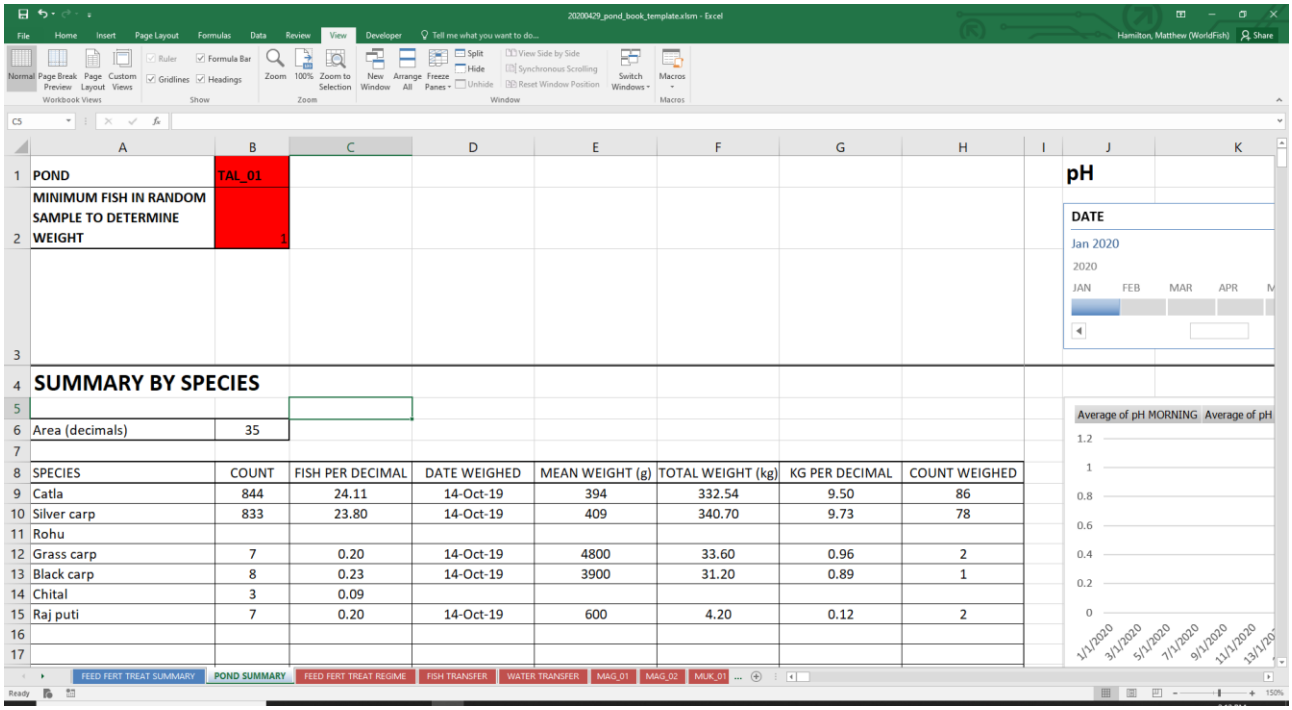
Outputs include estimates of fish weight by pond and species, estimates of feed, fertilise and treatments required in coming days ('FEED FERT TREAT SUMMARY' worksheet; Figure 11) and summaries of water chemistry, Secchi disc measurements and water depth, feed inputs, fertiliser inputs, water/pond treatments, weight of randomly sampled fish and mortalities by pond over time (POND SUMMARY' worksheet; Figure 12). Output worksheets have blue tabs. The only cells in the worksheets that may be changed by the user are highlighted in red. Note that to allow plots to refresh it is necessary to 'Trust access to the VBA project object model' (Figure 13) and enable macros when the file is opened.

There is an additional DATA TO PLOT worksheet that is hidden from users. It contains intermediate computations required to generate the plots in the POND SUMMARY worksheet.



	A	B	C	D	E	F	G	H	I	J	K	L
1	MINIMUM FISH IN RANDOM SAMPLE TO DETERMINE WEIGHT	1	Change this in the 'POND SUMMARY' sheet									
2												
3	POND	POND AREA	TOTAL COUNT	DATE WEIGHED RANGE		TOTAL WEIGHT (kg)	FEED 1 TYPE	FEED 1 FREQUENCY	FEED 1 AMOUNT PER APPLICATION	FEED 1 PREVIOUS APPLICATION	FEED 1 NEXT APPLICATION	FEED 2 TYPE
4		(Decimal)		(Earliest)	(Latest)			(Days)	(g)			
5	MAG_01	13										
6	MAG_02	30										
7	MUK_01	84	838		16-May-20	607.133	Mega Carp Grower	1	510.0		Today	
8	MUK_02	27	54		16-May-19	48.252	Mega Carp Grower	1	13.0		Today	
9	TAL_01	35	1702		14-Oct-19	742.233	Mega Pre Starter	2	1039.1		Today	
10	TAL_02	36	1622		14-Oct-19	818.996	Mega Pre Starter	2	1179.4		Today	
11	TAL_03	42	328		22-Mar-20	152.33	Mega Pre Starter	2	255.9		Today	
12	TAL_04	39	410		22-Mar-20	196.16	Mega Pre Starter	2	306.0		Today	
13	TAL_05	39	380		3-Mar-20	1373.851	Mega Carp Grower	2	2143.2		Today	
14	TAL_06	402	3271		3-Mar-20	5488.368	Mega Nursery Powder	2	88253.0		Today	
15	TAL_07	51	329		25-Mar-20	214.39	Mega Pre Starter	3	984.1		Today	
16	TAL_08	32	253		25-Mar-20	191.537	Mega Pre Starter	3	551.6		Today	
17	TAL_09	126	55		5-Mar-20							
18	TAL_10	22										

Figure 11. Some fields in the FEED FERT TREAT SUMMARY worksheet



	A	B	C	D	E	F	G	H	I	J	K
1	POND	TAL_01								pH	
2	MINIMUM FISH IN RANDOM SAMPLE TO DETERMINE WEIGHT	1								DATE	
3										Jan 2020	
4	SUMMARY BY SPECIES										
5											
6	Area (decimals)	35									
7											
8	SPECIES	COUNT	FISH PER DECIMAL	DATE WEIGHED	MEAN WEIGHT (g)	TOTAL WEIGHT (kg)	KG PER DECIMAL	COUNT WEIGHED			
9	Catla	844	24.11	14-Oct-19	394	332.54	9.50	86			
10	Silver carp	833	23.80	14-Oct-19	409	340.70	9.73	78			
11	Rohu										
12	Grass carp	7	0.20	14-Oct-19	4800	33.60	0.96	2			
13	Black carp	8	0.23	14-Oct-19	3900	31.20	0.89	1			
14	Chital	3	0.09								
15	Raj puti	7	0.20	14-Oct-19	600	4.20	0.12	2			
16											
17											

Figure 12. Some fields in the POND SUMMARY worksheet

Change macro settings in the Trust Center

Macro settings are located in the Trust Center. However, if you work in an organization, the system administrator might have changed the default settings to prevent anyone from changing settings.

> **Important:** When you change your macro settings in the Trust Center, they are changed only for the Office program that you are currently using. The macro settings are not changed for all your Office programs.

1. Click the **File** tab.
2. Click **Options**.
3. Click **Trust Center**, and then click **Trust Center Settings**.
4. In the **Trust Center**, click **Macro Settings**.
5. Make the selections that you want.
6. Click **OK**.

The following image is the **Macro Settings** area of the Trust Center.

Figure 13. Procedure to access the check box to that states ‘Trust access to the VBA project object model’

7. Changing access privileges

The Electronic Pond Book should be saved to a folder accessible to all members of the Carp Genetic Improvement Team. Different users of the Electronic Pond Book can be assigned different access privileges (full, read or read-write). Full access privileges are held by the Carp Genetic Improvement Program Geneticist and Platform Manager only. They are able to change the access privileges of others by clicking on File ⇨ Info ⇨ Protect Workbook ⇨ Restrict Access ⇨ Restricted Access (Figure 14).

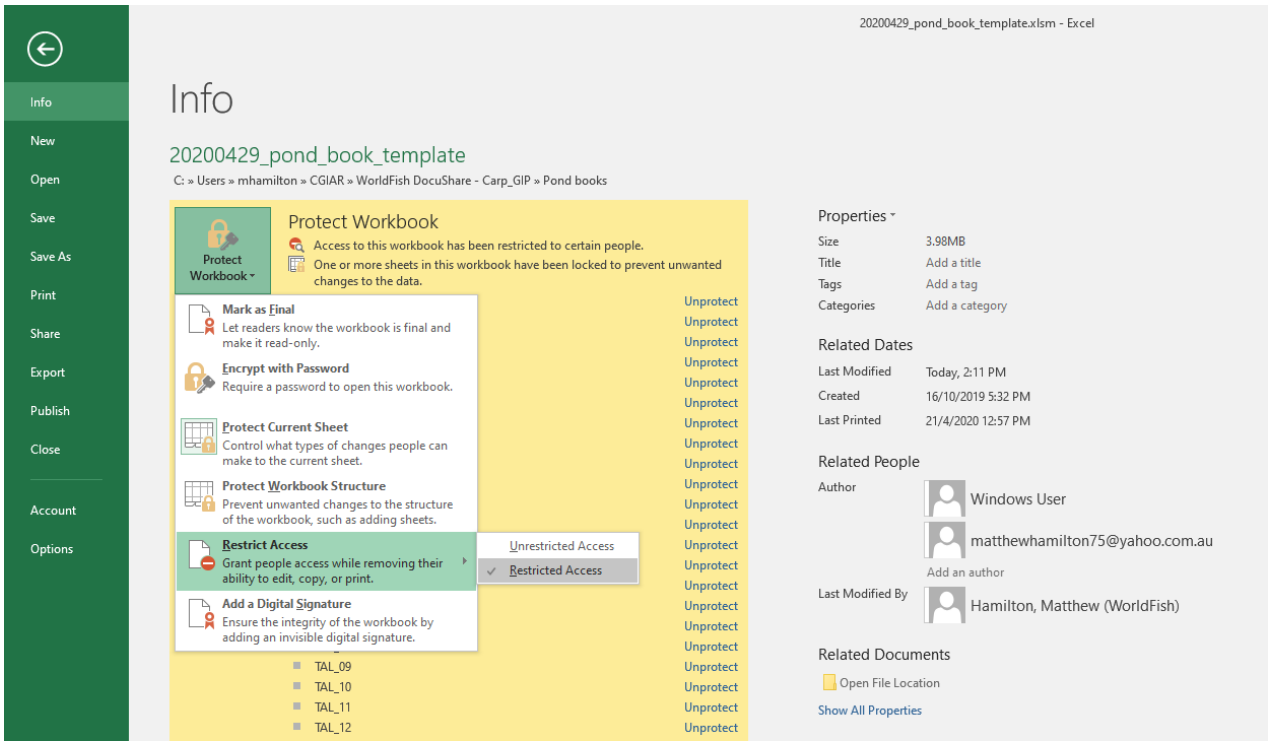


Figure 14. How to change access privileges

WorldFish

About WorldFish

WorldFish is an international, nonprofit research organization that harnesses the potential of fisheries and aquaculture to reduce hunger and poverty. Globally, more than one billion poor people obtain most of their animal protein from fish and 800 million depend on fisheries and aquaculture for their livelihoods. WorldFish is a member of CGIAR, a global research partnership for a food-secure future.